Columbia Generating Station
4Q/2009 Plant Inspection Findings

Initiating Events

Significance: G Sep 30, 2009
Identified By: NRC
Item Type: FIN Finding
Failure to Perform Inspections Resulted in Bus Failure and Reactor Scram
Green. The inspectors reviewed a self-revealing finding for the failure to follow Procedure PPM 1.5.13, “Preventive Maintenance Optimization Living Program,” Revision 16, for not evaluating the scope changes for the preventive maintenance inspections on the non segregated high voltage buses. The preventive maintenance work orders included visual inspection, cleaning, torque verification of the rigid and flexible bus connections, and high potential testing of the bus to ground. The inspectors reviewed completed work orders and determined that for all the work orders performed from 2001 through 2005 that the steps to check the torque verification of the bus connections and the high potential testing were inappropriately marked as not applicable. For the 2009 work orders, the inspectors found that the steps for the torque verification and the high potential testing were deleted. In doing so, the licensee was no longer using industry operating experience that was determined to be applicable to the station and had changed the scope of the work orders by not performing these steps; performance of these steps could have prevented the August 5, 2009, 6900 Vac bus failure.

The inspectors determined that the finding was more than minor because it impacted the human performance attribute of the Initiating Events Cornerstone objective to limit the likelihood of those events that upset plant stability and challenge critical safety functions during power operations. Using the Significance Determination Process Phase 1 worksheets from Inspection Manual Chapter 0609, the inspectors determined that the finding was of very low safety significance because it did not contribute to both the likelihood of a reactor trip and the likelihood that mitigation equipment or functions would not be available. This finding also had a human performance crosscutting aspect associated with the decision making component in that personnel performing the preventive maintenance work orders failed to use conservative assumptions and in doing so changed the scope of the work inappropriately [H.1(b)] (Section 2.3).

Inspection Report# : 2009010 *(pdf)*

Significance: G Sep 26, 2009
Identified By: Self-Revealing
Item Type: FIN Finding
Failure to Perform Back-up Monitoring
Green. The inspectors reviewed a self-revealing finding for the failure of Energy Northwest to implement the standards and guidance provided in Operations Instruction OI-09, “Operations Standards and Expectations,” Revision 24. As a result, an operator failed to ensure that the turbine lube oil exhauster system was adjusted to within its normal operating band after valve manipulations to clear an alarm in the control room. This resulted in a loss of an air-to-oil seal within the main turbine, which ultimately led to a manual plant scram.

This finding is more than minor because it affected the human performance attribute of the initiating events cornerstone’s objective to limit the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. This finding was determined to be of very low safety significance (Green) due to not contributing to both the likelihood of a reactor trip and the likelihood of mitigation equipment or functions not being available. A cross cutting aspect in human performance was identified with a work control component because Energy Northwest failed to incorporate actions to address plant conditions that may affect work activities [H.3(b)](Section 40A3).

Inspection Report# : 2009004 *(pdf)*

Significance: G May 08, 2009
Identified By: Self-Revealing
Item Type: FIN Finding
Reactor Scram Due to Seal Oil Leak for Main Generator
The inspectors reviewed a self-revealing finding for the failure of Energy Northwest to implement the standards and guidance provided in Site Wide Procedure SWP-CAP-01, "Corrective Action Program," Revision 17. Specifically, Energy Northwest failed to take prompt corrective action in response to Action Request 1485, dated September 2000, that identified the Cuno filter as a single point vulnerability, which could lead to a plant scram. Action Request 1485 recommended upgrading the type of filter in the seal oil system to a high efficiency duplex filter assembly. Due to a low priority ranking, corrective action was delayed several times. Action Request 1485-4, dated March 11, 2008, documented a scheduling error delaying the corrective action from fiscal year 2009 to fiscal year 2010 or 2011.

The finding was more than minor because it affected the Initiating Events Cornerstone objective to limit the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. Using Inspection Manual Chapter 0609.4, "Phase 1 – Initial Screening and Characterization of Findings," the finding was determined to be of very low safety significance (Green) because it did not contribute to both the likelihood of a reactor trip and the likelihood that mitigation equipment or functions will not be available. The finding had a crosscutting aspect in the area of problem identification and resolution associated with operating experience because the licensee failed to implement operational experience through changes to station processes, procedures, equipment, and training programs [P.2.(b)].

Inspection Report# : 2009003 *(pdf)*

Significance: G Feb 08, 2009
Identified By: Self-Revealing
Item Type: FIN Finding
Failure to Perform an Adequate Site Acceptance Test
The inspectors reviewed a self-revealing finding for the failure of Energy Northwest to perform an adequate site acceptance test of the digital electro-hydraulic system. Specifically, Energy Northwest failed to verify that the quad voter solenoid valves in the digital electro-hydraulic system could be replaced with the main turbine on-line. Consequently, when an on-line valve replacement was performed, the system experienced a pressure transient which resulted in a fast closure of the main turbine governor valves and a subsequent reactor scram. Energy Northwest entered the issue into the corrective action program and conducted a root cause evaluation.

This finding is greater than minor because it was a human performance error that affected the initiating events cornerstone objective to limit the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. The finding was of very low risk significance because the finding did not result in the loss of a safety function of a single train for greater than its technical specification allowed outage time. This finding was determined to have the crosscutting aspect of human performance with a decision making component, because Energy Northwest failed to perform an adequate effectiveness review to identify the possible unintended consequences of on-line replacement of quad voter solenoid valves in the digital electro-hydraulic system [H.1.b].

Inspection Report# : 2009002 *(pdf)*

Mitigating Systems

Significance: G Nov 21, 2009
Identified By: NRC
Item Type: NCV NonCited Violation
Failure to Promptly Correct an Adverse Trend in Keep Fill Pump Performance
Green. The team identified a noncited violation of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action,"

which occurred when the licensee failed to promptly correct an identified condition adverse to quality. Specifically, in 1998, the licensee identified an inadequate design of the in keep fill pumps for the reactor core isolation cooling system and emergency core cooling system that resulted in repetitive unexpected failures of the pumps. Corrective actions for this condition adverse to quality had been repeatedly deferred since the condition was originally identified; no effective corrective actions had been taken as of September 2009. The licensee entered this issue into their corrective action program as Action Request/Condition Report 204768.

This performance deficiency was more than minor because it was associated with the equipment performance attribute of the mitigating systems cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Using Inspection Manual Chapter 0609.04, “Phase 1 – Initial Screening and Characterization of Findings,” the team determined that this performance deficiency was of very low safety significance because it did not represent a loss of system safety function, did not represent the actual loss of safety function of a single train for greater than its technical specification allowed outage time, and did not screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event. The team determined that this finding had a crosscutting aspect in the resources component of the human performance area because the licensee failed to ensure that resources were available to minimize long-standing equipment issues [H.2 (a)].

Inspection Report# : 2009008 *(pdf)*

Significance: G Nov 21, 2009
Identified By: NRC
Item Type: NCV NonCited Violation
Failure to Ensure Suitability of Class 1E Electrical Components
Green. A noncited violation of 10 CFR Part 50, Appendix B, Criterion III, “Design Control,” was revealed on April 7, 2007, when overheating of a Class 1E power conditioning transformer resulted in a fire. The licensee determined that the failed transformer, which had been installed as part of a July 2000 design change, was of an inappropriate design for its application. The licensee replaced the transformer and entered this issue into their corrective action program as Action Request/Condition Report 204769.

This performance deficiency was more than minor because it was associated with the design control attribute of the mitigating systems cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Using Inspection Manual Chapter 0609.04, “Phase 1 – Initial Screening and Characterization of Findings,” the team determined that this performance deficiency was of very low safety significance (Green) because it did not represent a loss of system safety function, did not represent the actual loss of safety function of a single train for greater than its technical specification allowed outage time, and did not screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event. The team determined that this performance deficiency did not have a crosscutting aspect because it was not indicative of current licensee performance.

Inspection Report# : 2009008 *(pdf)*

Significance: G Nov 21, 2009
Identified By: NRC
Item Type: NCV NonCited Violation
Failure to Follow Housekeeping Program Requirements
Green. The team identified a noncited violation of 10 CFR Part 50, Appendix B, Criterion V, “Instructions, Procedures, and Drawings,” for the failure to properly implement housekeeping procedures to control transient equipment and materials. Specifically, the inspectors identified loose maintenance carts in both the control room and emergency diesel generator rooms, a large metal ramp in the emergency diesel generator room and improperly stored ladders the emergency core cooling system pump rooms. The licensee either secured or removed the equipment and entered this issue into their corrective action program as Action Request/Condition Report 204514.

The finding was more than minor because if left uncorrected, the programmatic deficiency could lead to a more significant safety concern. Using Inspection Manual Chapter 0609.04, “Phase 1 – Initial Screening and

Characterization of Findings," the finding was determined to have very low safety significance (Green) because it did not result in an actual loss of a system safety function, did not result in a loss of a single train of safety equipment for greater than its technical specification allowed outage time, did not involve the loss or degradation of equipment specifically designed to mitigate a seismic, flooding, or severe weather initiating event, and did not involve the total loss of any safety function that contributes to an external event initiated core damage accident sequence. This finding has a crosscutting aspect in the area of problem identification and resolution associated with the corrective action program area component because the licensee failed to have a low threshold for identifying deficient housekeeping issues [P.1(a)].

Inspection Report# : 2009008 *(pdf)*

Significance: G Sep 30, 2009
Identified By: Self-Revealing
Item Type: FIN Finding
Inadquate Technical Review of Design Change Packages
Green. The inspectors reviewed two examples of a self-revealing finding for the failure to follow Procedure SWP-DES-01, "Plant Modification & Configuration Control," Revision 11, for the modifications to the digital electrohydraulic control system and the reactor feedwater pumps. The first example occurred when the licensee installed a new digital electrohydraulic control system with an incorrect pressure setpoint due to an erroneous calculation in the plant design change. The licensee determined that this pressure setpoint was too low for expected pressures under all potential conditions, including transients. This resulted in the turbine bypass valves remaining open and causing the reactor pressure vessel to exceed the cooldown safety limit of 100°F per hour. The second example occurred when the licensee installed a new reactor feedwater level control system which raised and staggered the suction pressure setpoints between the pumps, and the time delay between the pumps was not staggered. The licensee's investigation into the reactor feedwater trips determined that the speed setpoint that the level control system allowed the reactor feedwater pumps to achieve was too high.

The inspectors determined that the finding was more than minor because it affected the Mitigating Systems Cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Using the Significance Determination Process from Inspection Manual Chapter 0609, the inspectors determined that a Phase 3 analysis was required. Based on the senior reactor analyst's significance determination process Phase 3 analysis, this finding was determined to have very low safety significance. This finding had a human performance crosscutting aspect associated with the work practices component in that the personnel associated with the technical review did not use human error prevention techniques commensurate with the assigned task [H.4(a)] (Section 2.1).

Inspection Report# : 2009010 *(pdf)*

Significance: G Sep 26, 2009
Identified By: NRC
Item Type: NCV NonCited Violation
Failure to Adequately Implement the Requirements of Procedure SOP-ENTRY-DW
Green. The inspectors identified a noncited violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," for Energy Northwest's failure to effectively implement procedure SOP-ENTRY-DW, "Personnel Entry into Drywell." Energy Northwest's corrective actions for this issue included removing the NRC identified debris from the drywell, informing personnel of the ineffective drywell cleaning, and conducting an assessment to determine more effective methods for cleaning the drywell during future outages.

The finding was greater than minor because, if left uncorrected, it could result in the continued accumulation of foreign material in the drywell. The accumulation of foreign material could result in blocking the emergency core cooling system suction strainers during normal operation or accident conditions. The finding was determined to be of very low risk significance (Green) since the debris did not result in an actual loss of safety function for any system and because the debris was removed by the licensee. A crosscutting aspect in problem identification and resolution, with a corrective action program component was identified in that the licensee failed to ensure that corrective actions were taken to address a previously identified adverse trend [P.1(d)](Section 1R20).

Inspection Report# : 2009004 *(pdf)*

Significance: G Mar 28, 2009
Identified By: NRC
Item Type: NCV NonCited Violation
Failure to perform engineering evaluation to determine seismic qualificaiton of safety-related equipment
The inspectors identified a noncited violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," for Energy Northwest's failure to follow procedure PPM 10.2.53, "Seismic Requirements for Scaffolding, Ladders, Man-Lifts, Tool Gang Boxes, Hoists, Metal Storage Cabinets, and Temporary Shielding Racks," Revision 26. Specifically, the position of equipment is required to meet specific criteria to prevent damage to safety related equipment during a seismic event. Contrary to this procedure, the inspectors identified that equipment was routinely positioned next to safety-related equipment without a supporting engineering evaluation.

This finding is greater than minor because it was a human performance error which affected the mitigating systems cornerstone objective to ensure the availability and reliability of systems that respond to initiating events to prevent undesirable consequences. This was determined to be consistent with NRC Manual Chapter 0612, "Power Reactor Inspection Reports," Appendix E, Example 4.a. for being more than minor risk significance because Energy Northwest had routinely failed to perform the requisite engineering evaluation. The finding was determined to be of very low risk significance (Green) because no actual loss of safety function occurred and the finding did not screen as potentially risk significant due to external events. Specifically, the as-found position of the equipment was determined to not adversely affect seismic qualification of the affected safety-related components. A crosscutting aspect in human performance with a work control component was identified in that Energy Northwest failed to appropriately plan work on multiple occasions, resulting in job site conditions which may have impacted plant components [H.3.a]..

Inspection Report# : 2009002 *(pdf)*

Significance: G Jul 13, 2006
Identified By: NRC
Item Type: AV Apparent Violation
Lack of an Evaluation of the Effect of Fire on the Reactor Protection System / Scram Capability
The team identified an apparent violation (AV) of License Condition 2.C.(14) concerning failure to evaluate the potential effect of fire damage on the Reactor Protection System circuits relied upon for reactor scram capability in the approved fire protection program. Although the reactor protection and control rod drive systems are identified as part of the minimum safe shutdown systems necessary to accomplish the reactivity control shutdown function, and are credited in the post-fire safe shutdown procedures developed by the licensee, the potential for fire to cause a loss of this required shutdown function had not been evaluated. The licensee's post-fire safe shutdown analysis included the assumption that the operator would initiate and confirm shutdown before control circuits were damaged, therefore, evaluation of the effects of fire damage to the reactor protection (RPS) and control rod drive (CRD) systems was not necessary. Review of the RPS circuits identified the potential for a fire in the control room to prevent the scram of one rod group.

The finding is greater than minor in that it affected the ability to achieve and maintain hot shutdown following a control room fire. This finding is associated with the Mitigating Systems cornerstone and the respective attribute of protection against external factors (e.g., fire). This finding impacted the mitigating systems cornerstone objective to ensure the availability, reliability, and capability of systems that respond to external events (such as fire) to prevent undesirable consequences. It is the NRC's understanding that the licensee does not consider these circuit vulnerabilities to be violations of NRC requirements. The licensee considers multiple hot shorts due to fire in the control room to be outside of the plant licensing basis for the Fire Protection Program. Specifically, in this case, two hot shorts due to fire induced circuit damage would be required to prevent the scram of one rod group. The NRC staff and the industry are currently working on developing a resolution methodology to address these types of potential fire induced circuit failures. The team concluded that this violation meets the criteria of the NRC Enforcement Manual Section 8.1.7.1 for deferring enforcement actions for postulated fire induced circuit failures.

Inspection Report# : 2006008 *(pdf)*

Barrier Integrity

Emergency Preparedness

Significance: G Aug 28, 2009
Identified By: NRC
Item Type: NCV NonCited Violation
Failure to Provide Adequate Respiratory Protection Equipment for Emergency Response
Green. The inspectors identified a non-cited violation of 10 CFR 50.47(b)(10) for the failure to provide adequate respiratory protection equipment for emergency response, compromising the protective actions developed for the plume exposure pathway for emergency workers. Adequate quantities of small sized self-contained breathing apparatus respirator masks were not available in the control room for licensed plant operators that were fit-tested for small sizes. This issue was entered into the licensee's corrective action program as Action Request 00201679.

This finding is greater than minor because it is associated with the Emergency Preparedness Cornerstone attribute of response organization performance and adversely affects the cornerstone objective of ensuring the licensee is capable of implementing adequate measures to protect the health and safety of the public in the event of a radiological emergency. The finding was evaluated using Inspection Manual Chapter 0609, Appendix B, "Emergency Preparedness Significance Determination Process," Sheet 1, "Failure to Comply." The issue described was a planning standard problem, was not a risk-significant planning standard problem, and did not involve a planning standard function failure. Therefore, the finding is of very low safety significance. This finding has a crosscutting aspect in the area of human performance, associated with resources because the licensee did not have enough small sized self-contained breathing apparatus respirator masks available in the control room for licensed plant operators that were fit-tested for small sizes [H.2(d)](Section 2OS3).

Inspection Report# : 2009009 *(pdf)*

Occupational Radiation Safety

Significance: G Jun 27, 2009
Identified By: Self-Revealing
Item Type: NCV NonCited Violation
Failure to Barricade and Conspicuously Post a High Radiation Area
A self-revealing noncited violation of Technical Specification 5.7.1 was identified for failure to barricade and conspicuously post a high radiation area. On April 14, 2009, equipment drain radioactive tank 5 was completely drained which created an unposted high radiation area. Two workers near the tank area received dose rate alarms indicating that unexpected radiological conditions existed. Radiation protection personnel responded to the area, performed surveys, and found an unexpected high radiation area outside of the posted high radiation area boundary. The highest dose rate outside the existing boundary was approximately 200 millirem/hour. The licensee entered this item into their corrective action program as Action Request 195295.

The failure to barricade and conspicuously post a high radiation area is a performance deficiency. The finding was greater than minor because it was associated with the Occupational Radiation Safety Cornerstone attribute (exposure control) of program and process and affected the cornerstone objective, in that, failure to post a high radiation area impacted the ability to adequately protect workers health and safety from exposure to radiation. Using Inspection Manual Chapter 0609, Appendix C, "Occupational Radiation Safety Significance Determination Process," the finding was determined to be of very low safety significance because it was not an as low as is reasonably achievable finding, there was no overexposure or substantial potential for an overexposure, and the ability to assess dose was not

compromised. Additionally, this finding had human performance crosscutting aspects associated with work control in that the work planning did not appropriately plan work activities by incorporating risk insights and radiological safety [H.3(a)

Inspection Report# : 2009003 *(pdf)*

Public Radiation Safety

Physical Protection

Although the NRC is actively overseeing the Security cornerstone, the Commission has decided that certain findings pertaining to security cornerstone will not be publicly available to ensure that potentially useful information is not provided to a possible adversary. Therefore, the cover letters to security inspection reports may be viewed.

Miscellaneous

Significance: SL-IV May 13, 2008
Identified By: NRC
Item Type: VIO Violation
Willful Violation by a project manager who instructed plant workers to reach across a contamination boundary without radiation protection approval
During an NRC investigation and subsequent in-office inspection completed on May 13, 2008, a violation of NRC requirements was identified. In accordance with the NRC Enforcement Policy, the violation is listed below:

Technical Specification 5.4.1.a states, that written procedures shall be established, implemented, and maintained covering the applicable procedures recommended in Regulatory Guide 1.33, Revision 2, Appendix A, February 1978. Regulatory Guide 1.33, Appendix A, Section 7.e (1), specifies procedures for “Access Control to Radiation Areas Including a Radiation Work Permit System.”

Columbia Generating Station Procedure GEN-RPP-04, “Entry into, Conduct in, and Exit from Radiologically Controlled Areas,” Revision 14, states, in part, “Do not reach over, or cross contaminated area boundaries without RP approval.”

Contrary to the above, during repair of the HPCS-P-1 flange on June 16, 2007, a project manager instructed plant workers to reach across a contamination boundary without radiation protection approval.

This is a Severity Level IV violation. (Supplement IV)

Inspection Report# : 2008008 *(pdf)*

Last modified : March 01, 2010