Columbia Generating Station
3Q/2007 Plant Inspection Findings

Initiating Events

Significance: G Sep 28, 2007
Identified By: Self-Revealing
Item Type: FIN Finding
Failure to Adhere to Operations Standards and Expectations
Green. A Green self-revealing finding was identified for the failure of operations staff to adhere to an operations instructions which provided operating expectations and standards for dealing with uncertain situations and time critical decisions. This resulted in the inadvertent loss of a condensate booster pump and a resultant reactor trip when operators attempted to shift the pump's lube oil duplex strainer with the pump in operation. This occurred while a second condensate booster pump was already out-of-service and the reactor at 70 percent power. The operating crew conducted the lube oil strainer shift even though the filter swap was not a time critical evolution and the operating condition of the pump had not been investigated. Energy Northwest entered the issue into the corrective action program and conducted a root cause evaluation.

This finding is greater than minor because it is a human performance issue which affected both the initiating events and mitigating systems cornerstone objectives to limit the likelihood of those events that upset plant stability and ensure the availability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the loss of a condensate booster pump resulted in a loss of reactor feedwater pumps (Mitigating System) which resulted in a reactor scram on low reactor water level (Initiating Event). A Phase 1 Significance Determination Process evaluation determined that a Phase 2 evaluation was required because two cornerstones were affected by the performance deficiency (Initiating Events and Mitigating Systems). The inspectors consulted with a regional senior reactor analyst and determined that a Phase 3 analysis was required because a Phase 2 evaluation using the site specific worksheets did not adequately assess a loss of condensate booster pump event at reduced reactor power. As a result, a Phase 3 analysis was performed by the senior reactor analyst. Key assumptions included the probability of MSIV closure upon a loss of feed, operator recovery of the power conversion system following an MSIV closure, and the effect of containment failure on HPCS functionality. The core damage frequency result was less than 1.0E-6/yr. The initial screening of delta-LERF was slightly greater than 1.0E-7/yr., but a refinement of this result yielded a value less than 1.0E-7/yr. Consequently, the significance of the finding was determined to be of very low risk significance (Green). The cause of the finding is related to the cross-cutting aspect of human performance with a decision making component (H.1.b) because operations staff failed to use conservative assumptions regarding operation of the condensate booster pump lube oil duplex strainer, contrary to relevant operations department standards and expectations. (Section 4OA3.2)

Inspection Report# : 2007004 *(pdf)*

Significance: G Jun 29, 2007
Identified By: NRC
Item Type: NCV NonCited Violation
Failure to Perform Adequate Oversight of Vendor Activities
Green. The inspectors identified a Green NCV of 10 CFR 50.55a(g)4 for the failure to meet the requirements of American Society of Mechanical Engineers (ASME) Code Section XI. Specifically, the licensee failed to provide adequate oversight of vendor activities which resulted in an examination on an American Society of Mechanical Engineers Code Class 1 weld being incorrectly accepted. On May 23, 2007, during review of the licensee's radiographic examination of the reactor recirculation line valve replacement welding activities, the inspectors questioned the quality of some of the film results that had been accepted by the licensee. Upon reinspection of the film in question, it was discovered that certain sections of the film were not within the code required density range of 2.0 to 4.0.

This finding was of more than minor significance because it is associated with the Initiating Events cornerstone attribute of “Equipment Performance” and it affected the associated 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 inspectors determined that the finding was not appropriate for use with the Significance Determination Process because the finding is not associated with the increase in the likelihood of an initiating event. The acceptable reshoot of the weld determined there were no flaws greater than the acceptance criteria, therefore, there was no increase in the likelihood of an initiating event. While the finding is not suitable for Significance Determination Process evaluation, it has been reviewed by NRC management and is determined to be a finding of very low safety significance (Green). The inspectors also determined that the cause of this finding was related to the work practices component (H.4 c) of the human performance cross-cutting area of NRC Manual Chapter 0305 because the licensee failed to ensure supervisory and management oversight of work activities, including contractors, such that nuclear safety was not supported. (Section 1R08)

Inspection Report# : 2007003 *(pdf)*

Significance: G Mar 30, 2007
Identified By: Self-Revealing
Item Type: NCV NonCited Violation
Inadequate Reactor Protection Procedure and Subsequent Inadvertent Isolation of Shutdown Cooling
Green. A self-revealing noncited violation of Technical Specification 5.4.1.a was identified for an inadequate procedure which resulted in an inadvertent isolation of shutdown cooling. A procedure step required opening an incorrect electrical power supply disconnect, subsequently causing a decay heat removal suction isolation valve to inadvertently close while decay heat removal was in service. Energy Northwest entered the issue into the corrective action program and implemented corrective actions to revise the affected procedure and to evaluate the extent of condition.

The finding was more than minor because it was a procedure quality issue that impacted 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 inspectors utilized the “Significance Determination Process,” Manual Chapter 0609, to assess the safety significance of the finding. Per Appendix G, Shutdown Operations, Table 1, the inspectors determined the finding involved a loss of control due to loss of thermal margin and therefore the finding had potential safety significance greater than very low safety significance. A Phase 2 and 3 analysis was performed by a senior reactor analyst and staff from the Office of Nuclear Reactor Regulation. The Phase 2 and 3 analysis concluded that the finding was of very low safety significance (Green). Assumptions and factors which mitigated the safety significance of the finding are included in Attachment 2. This finding had crosscutting aspects in the area of human performance with a resources component in that operators were not provided with an accurate procedure which directly resulted in the inadvertent isolation of shutdown cooling and interruption of decay heat removal. (Section 4OA5.2)

Inspection Report# : 2007002 *(pdf)*

Mitigating Systems

Significance: G Jun 29, 2007
Identified By: Self-Revealing
Item Type: FIN Finding
Degraded Diesel Generator Output Breakers
Green. A self-revealing Green finding was identified for the failure to maintain the design of the station’s division 1 and 2 diesel generator output breakers. This resulted in reduced reliability of the breakers to function as designed during surveillance testing. Specifically, the breakers may not reset to a standby configuration to be able to automatically close following opening of the breaker. This would only be applicable during surveillance testing when the breaker was closed while the associated diesel generator was paralleled to an offsite source of power. Energy Northwest implemented immediate corrective actions to declare the breakers inoperable during surveillance testing

when the breakers were closed.

This finding was more than minor because the finding had an attribute of design control which affected the mitigating systems cornerstone objective to ensure the reliability of systems that respond to initiating events to prevent undesirable consequences. Utilizing NRC Manual Chapter 0609 Appendix A, “Significance Determination of Reactor Inspection Findings for At-Power Situations,” Phase 1 screening, the inspectors determined that the finding was of very low risk significance (Green) because reliability of the breakers was only affected during surveillance testing activities. Additionally, the finding was not associated with a qualification deficiency, did not result in a loss of safety function for a system, did not result in a loss of train for greater than its technical specification allowed outage time, and was not risk significant due to external initiating events. (Section 1R15)

Inspection Report# : 2007003 *(pdf)*

Significance: G Jun 29, 2007
Identified By: Self-Revealing
Item Type: NCV NonCited Violation
Failure to Provide Adequate Procedural Configuration Control for Pressure Switch, RHR-PS-19A, During Planned Surveillance Activities
Green. A self-revealing noncited violation Technical Specification 5.4.1.a was identified for a failure to provide adequate procedures for configuration control of pressure switch, RHR-PS-19A, during planned surveillance activities. This contributed to RHR-PS-19A being inadvertently left valved out-of-service following a planned maintenance activity and rendering a pump permissive input to the automatic depressurization system inoperable. Energy Northwest implemented immediate corrective actions to restore RHR-PS-19A to an operable condition and entered the issue into the corrective action program for final evaluation and resolution.

This self-revealing finding was more than minor because the finding had an attribute of procedure quality which affected the mitigating systems cornerstone objective to ensure the reliability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the failure to provide adequate procedures for configuration control resulted in the isolation of RHR-PS-19A and a degraded automatic depressurization system function. Utilizing NRC Manual Chapter 0609 Appendix A, “Significance Determination of Reactor Inspection Findings for At-Power Situations,” Phase 1 screening, the inspectors determined that the finding was of very low risk significance (Green) because although one automatic depressurization system pump permissive pressure switch was inoperable, there was sufficient redundancy in the design of the system to assure that the system remained operable. Additionally, the finding was not a qualification issue confirmed not to result in loss of operability, did not represent a loss of safety function for a single train or for the system, and did not screen as potentially risk significant due to external events. (Section 4OA3.4)
Inspection Report# : 2007003 *(pdf)*

Significance: G Jun 29, 2007
Identified By: Self-Revealing
Item Type: NCV NonCited Violation
Failure to Provide Adequate Drawings to Support Emergent Work
Green. A self-revealing noncited violation of Technical Specification 5.4.1.a associated with Energy Northwest’s failure to establish adequate drawings to support emergent work was identified. As a result, Energy Northwest failed to identify during the work planning process that lifting of a neutral ground on transformer, E-TR-IN/2, to support replacement of the transformer, would result in a loss of neutral ground to a safety-related power panel, E-PP-8AA. This resulted in inoperability of E-PP-8AA.

The inspectors determined that this self-revealing finding was more than minor because the finding had an attribute of procedure quality which affected the mitigating systems cornerstone objective to ensure the reliability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the failure to provide adequate engineering drawings showing accurate system configuration impacted the ability to accurately plan and implement work, resulting in inadvertently degrading a power supply for safety-related components. Utilizing NRC Manual Chapter 0609 Appendix A, “Significance Determination of Reactor Inspection Findings for At-Power Situations,” Phase 1 screening, the inspectors determined that the finding was of very low risk significance (Green) because appropriate compensatory actions were taken for the equipment that was affected by the inoperable power panel.

Additionally, the finding was not a qualification issue confirmed not to result in loss of operability, did not represent a loss of safety function for a single train or for the system, and did not screen as potentially risk significant due to external events. (Section 4OA3.1)
Inspection Report# : 2007003 *(pdf)*

Significance: G Mar 30, 2007
Identified By: Self-Revealing
Item Type: NCV NonCited Violation
Inadequate Clearance Order Results in Inoperable Diesel Generator
Green. A self-revealing noncited violation of Technical Specification 5.4.1.a was identified for the failure to provide an adequate work instruction (clearance order) resulting in the failure of three diesel generator room ventilation fans to start when required during a surveillance test of the associated diesel generator, DG-1. This resulted in inoperability of DG-1. Energy Northwest implemented immediate corrective actions to restore the diesel generator to an operable condition and entered the issue into the corrective action program for final evaluation and resolution.

This finding was more than minor because the finding had an attribute of procedure quality which affected the mitigating systems cornerstone objective to ensure the availability of systems that respond to initiating events to prevent undesirable consequences. The finding was of very low safety significance (Green) because, although DG-1 operability was affected, the licensee restored DG-1 to an operable condition within the technical specification allowed outage time. Additionally, the finding was not associated with a qualification deficiency, did not result in a loss of safety function for a system, and was not risk significant due to external initiating events. This finding had crosscutting aspects in the area of human performance with a resources component because Energy Northwest failed to provide an accurate work package to support planned maintenance. The inadequate work package directly contributed to the resultant loss in control power to the affected DG-1 room ventilation fans, resulting in the inoperability of DG-1. (Section 1R19)
Inspection Report# : 2007002 *(pdf)*

Significance: G Mar 30, 2007
Identified By: NRC
Item Type: NCV NonCited Violation
Inadequate Battery Surveillance Test (Section 1R22)
Green. An NRC identified noncited violation of TS 5.4.1.a for an inadequate battery surveillance test procedure was identified because of the use of a non-conservative specific gravity electrolyte level correction factor. This resulted in the inability of Energy Northwest to properly assess the condition of the station's safety-related batteries to technical specification specific gravity limitations. Energy Northwest entered the issue into the corrective action program and planned to revise the affected procedures prior to its next use.

This finding was more than minor because the finding had an attribute of procedure quality which affected the mitigating systems cornerstone objective to ensure the reliability of systems that respond to initiating events to prevent undesirable consequences. Specifically, use of a non-conservative specific gravity level correction factor could affect the ability to adequately monitor the reliability and capability of the station's safety-related batteries. The finding was of very low safety significance (Green) because specific gravity level correction factor was never used during surveillance testing ensuring that historical test data was accurate. Additionally, the finding was not associated with a qualification deficiency, did not result in a loss of safety function for a system, and was not risk significant due to external initiating events. (Section 1R22)

Inspection Report# : 2007002 *(pdf)*

Significance: G Mar 30, 2007
Identified By: Self-Revealing
Item Type: NCV NonCited Violation
Inadequate Immediate Corrective Actions for Electrical Disconnect Deficiency (Section 4OA2.2)
Green. A self-revealing noncited violation of 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action," was identified for failure to take prompt corrective actions for conditions adverse to quality to assure the seismic qualification of safety-related electrical disconnects was maintained. This resulted in the subsequent tripping open of a

safety-related electrical disconnect used to provide power to a containment isolation valve. Energy Northwest entered the issue into the corrective action program and took action to implement interim corrective actions to verify that seismic qualification of affected electrical disconnects was met.

The finding was more than minor because the finding affected the capability of safety-related electrical disconnects to reliably remain closed during a seismic event. This affected the equipment performance attribute of the mitigating systems cornerstone objective to ensure the availability and reliability of systems that respond to initiating events to prevent undesirable consequences. The finding was of very low safety significance (Green) because the finding was a qualification deficiency confirmed not to result in loss of operability. Specifically, although full qualification of several safety-related disconnects was affected due to potential inadequate past preventative maintenance and hardened lubricant, subsequent verifications by Energy Northwest determined that the affected disconnects were fully latched closed and therefore seismically qualified in the as-found fully latched condition. Additionally, the finding did not result in a loss of safety function for a system and was not risk significant due to external initiating events. This finding had crosscutting aspects in the area of problem identification and resolution with a corrective action program component because Energy Northwest failed to adequately assess operability of affected electrical disconnects. This contributed to Energy Northwest's failure to take prompt corrective actions to ensure full latched closure of the affected disconnects resulting in the subsequent failure of a disconnect. (Section 4OA2.2)

Inspection Report# : 2007002 *(pdf)*

Significance: G Dec 31, 2006
Identified By: Self-Revealing
Item Type: NCV NonCited Violation
Failure to Follow Diesel Generator Test Procedure
Green. A green self-revealing non-cited violation (NCV) of technical specification 5.4.1.a was identified for the failure to follow a diesel generator surveillance test procedure. This resulted in the unintentional inoperability of the backup transformer. Energy Northwest entered the issue into their corrective action program for evaluation and resolution.

This finding was more than minor because it had an attribute of human performance which affected the mitigating systems cornerstone objective to ensure the availability of systems that respond to initiating events to prevent undesirable consequences. The finding was of very low risk significance (Green) because it was not a qualification issue confirmed not to result in loss of operability, did not represent a loss of safety function for a single train for greater than its technical specification allowed outage time, and did not screen as potentially risk significant due to external events. Additionally, the cause of the finding is related to the cross-cutting aspect of human performance with a work practices component in that self and peer-checking techniques were not implemented properly during the conduct of the test procedure. This resulted in the failure to follow procedure.
Inspection Report# : 2006005 *(pdf)*

Significance: G Dec 31, 2006
Identified By: NRC
Item Type: NCV NonCited Violation
Failure to Promptly Identify Degraded Conduit Jackets
A green NRC identified NCV of 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action," was identified for failing to promptly identify conditions adverse to quality associated with loss of full environmental qualification of plant components due to degraded flexible electrical conduit jackets. Energy Northwest entered the issue into their corrective action program and took immediate action to repair the identified degraded conduit jackets and to plan additional periodic plant walkdowns to identify additional degraded conduit jackets.

The finding was more than minor because it was associated with the equipment performance attribute of the mitigating systems cornerstone and it affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to preclude undesirable consequences (i.e., core damage). The finding was determined to be of very low safety significance (Green) because the finding was a qualification deficiency confirmed not to result in loss of operability per "Part 9900 Technical Guidance, Operability Determination Process for Operability and Functional Assessment." This finding had a crosscutting aspect associated with problem identification and resolution with a corrective action program component. Specifically, Energy Northwest failed to

assess and trend information from the corrective action program in the aggregate resulting in the failure to identify an adverse trend regarding flexible electrical conduit jackets.
Inspection Report# : 2006005 *(pdf)*

Significance: G Dec 31, 2006
Identified By: NRC
Item Type: NCV NonCited Violation
Inadequate Alternate Boron Injection Emergency Procedure
Green. A green NRC identified NCV of technical specification 5.4.1.a was identified for the failure to provide an adequate procedure for alternate boron injection. Specifically, procedure Emergency Support Procedure 5.5.8, "Alternate Boron Injection," Revision 8, failed to direct venting of a temporarily installed hose between the standby liquid control boron storage tank and the reactor core isolation cooling pump suction. As a result, degraded reactor core isolation cooling pump performance could occur. Energy Northwest entered the issue into their corrective action program and revised the procedure to vent the hose.

This finding was more than minor because the finding had an attribute of procedure quality which affected the mitigating systems cornerstone objective to ensure the availability and reliability of systems that respond to initiating events to prevent undesirable consequences. The finding was of very low risk significance (Green) because it was not a qualification issue confirmed not to result in loss of operability, did not represent a loss of safety function for a single train or for the system, and did not screen as potentially risk significant due to external events.
Inspection Report# : 2006005 *(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 Jun 29, 2007
Identified By: NRC
Item Type: NCV NonCited Violation
Inadequate Compensatory Actions Related to Out-of-Service Seismic Monitoring Instruments
Green. An NRC identified noncited violation of 10 CFR 50.54(q) was identified for Energy Northwest's failure to effectively maintain a standard emergency action level scheme in place when adequate compensatory measures to address out-of-service seismic instruments were not implemented. The seismic monitoring instrumentation provided an input to the station's emergency plan for declaring an unusual event or alert as a result of seismic activity detected on site. The lack of adequate compensatory measures would most likely have delayed accurate classification of an event and therefore adversely affected the ability to promptly implement the site's emergency plan.

The finding is of more than minor risk significance because it was related to the cornerstone attribute of response organization performance and affected the Emergency Preparedness cornerstone objective because inability to implement an emergency action level diminishes the licensee's capability to protect the health and safety of the public. Utilizing the "Failure to Comply" flowchart of Manual Chapter 0609, Appendix B, "Emergency Preparedness Significance Determination Process," issued March 6, 2003, the finding was determined to be of very low risk significance (Green) because the finding did not represent a loss of function or degradation of a Risk Significant Planning Standard in that other seismic recording instruments were available which would permit Energy Northwest to make an accurate classification of the event, although the classification would most likely be substantially delayed beyond 15 minutes from the occurrence of an earthquake. The result was consistent with Section 4.4 of MC 0609, Appendix B, which provided examples where a finding would be of very low risk significance for changes to equipment which creates a condition where an existing emergency action level would not be declared for any alert or notification of unusual event. This finding had crosscutting aspects in the area of problem identification and resolution (corrective action program component) in that Energy Northwest failed to take appropriate corrective actions in response to a previously documented condition report which identified concerns with adequate implementation of the emergency plan with the seismic monitors out of service (P.1(d)). This directly contributed to recurring instances of inadequate compensatory measures being utilized. (Section 4OA5.1)

Inspection Report# : 2007003 *(pdf)*

Occupational Radiation Safety

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

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