Columbia Generating Station
2Q/2007 Plant Inspection Findings

Initiating Events

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 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 Sep 30, 2006
Identified By: NRC
Item Type: NCV NonCited Violation
Failure to implement adequate design control measures for the station's safety-related batteries
The inspectors identified a noncited violation of 10 CFR 50, Appendix B, Criterion III, "Design Control," when Energy Northwest failed to perform adequate design reviews to maintain appropriate control of the design and qualification of the station's safety related batteries. Specifically, the repetitive failure to provide adequate engineering analysis supporting the temporary installation of a non class 1E battery rail charger on a safety-related battery was not commensurate with ensuring the reliability of the station's safety-related batteries.

This finding was more than minor because the finding was a design control issue which affected the mitigating systems cornerstone objective to ensure the availability and reliability of systems that respond to initiating events to prevent undesirable consequences. Utilizing MC 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 because it was a qualification issue confirmed not to result in loss of operability. Additionally, the finding 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. This finding had cross-cutting aspects in the area of problem identification and resolution with the corrective action component in that the licensee did not thoroughly evaluate design issues with the nonqualified rail charger, as documented in Condition Report 2-05-01894. This resulted in additional examples of the failure to maintain adequate design control of the batteries.
Inspection Report# : 2006004 *(pdf)*

Significance: G Jul 13, 2006
Identified By: NRC
Item Type: NCV NonCited Violation
Failure to Ensure Redundant Safe Shutdown Systems Located In the Same Fire Area Are Free of Fire Damage
The team identified a noncited violation (NCV) of License Condition 2.C.(14), Fire Protection Program (Generic Letter 86-10), for failure to ensure that redundant trains of safe shutdown systems in the same fire area were free of fire damage. The Columbia Generating Station's approved fire protection program states that it complies with the requirements of Section III.G of 10 CFR 50, Appendix R. Section III.G.2 of Appendix R requires that cables whose fire damage could prevent the operation or cause maloperation of safe shutdown functions be physically protected from fire damage. Contrary to this requirement, the licensee implemented a methodology that utilized manual operator actions for fire other than a control room fire to mitigate the effects of fire damage in lieu of providing physical protection from fire damage.

This finding is of greater than minor safety significance because it 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. The team found that the manual operator actions were reasonable (as defined in Enclosure 2 of Inspection Procedure 71111.05T), and could be performed within the analyzed time limits. Since the manual operator actions were considered reasonable, the significance determination process was not entered. The team determined that this finding is of very low safety significance (Green) in accordance with the guidance in Enclosure 2 to Inspection Procedure 71111.05T.
Inspection Report# : 2006008 *(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)*

Significance: G Jul 03, 2006
Identified By: Self-Revealing
Item Type: NCV NonCited Violation
Failure to Promptly Identify Degraded Shaft Couplings in Standby Service Water Pumps
Green. A Green self-revealing noncited violation of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Actions," was identified for failure to promptly identify conditions adverse to quality associated with the safety-related standby service water pumps. Specifically, Energy Northwest failed to implement actions identified in 1994 in response to external operating experience (Information Notice 93-68) associated with the standby service water pumps. The failure to implement the actions resulted in the failure to promptly identify that shaft couplings on standby service water pump 1A pump shaft had failed due to intergranular stress corrosion cracking prior to the failure revealing itself on June 14, 2005. Energy Northwest later determined during an inspection in December 2005, that a coupling on standby service water pump 1B pump shaft had also failed, although the pump continued to demonstrate acceptable performance. Energy Northwest replaced both standby service water pumps and implemented corrective actions to ensure periodic future inspections of service water pumps 1A and 1B to ensure their operational readiness.

This finding is greater than minor because it was an equipment reliability issue which impacted the mitigating systems cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Although the finding affected the mitigating systems cornerstone objectives, the finding was of very low safety significance because the finding did not result in a loss of function of standby service water pump 1A, did not result in a loss of safety function of the system, did not represent a loss of safety function of non-technical specification equipment, and did not screen as potentially risk significant due to external events. The cause of the finding was related to the cross-cutting element of problem identification and resolution because of Energy Northwest's failure to implement identified actions to inspect either standby service water pump in response to Information Notice 93-68. (Section 4OA2.2)

Inspection Report# : 2006011 *(pdf)*

Barrier Integrity

Emergency Preparedness

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

Last modified : August 24, 2007