

Wolf Creek 1

2Q/2007 Plant Inspection Findings

Initiating Events

Significance:  Oct 07, 2006

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

Failure to follow procedure results in loss of coolant charging flow

The inspectors reviewed a self-revealing noncited violation of Technical Specification 5.4.1.a involving the licensee's failure to follow a procedure that resulted in a loss of coolant charging flow during a planned surveillance. The licensee entered this issue into their corrective action program as Condition Report 2006-0002030.

The failure to follow station procedures was considered a performance deficiency. This finding was more than minor because it affected the human performance attribute of the initiating events cornerstone and the cornerstone objective to limit the likelihood of those events that upset plant stability and challenge critical safety functions. Using Manual Chapter 0609, "Significance Determination Process," Phase 1 worksheets, this finding screened to a Phase 2 analysis because it affected both the initiating events and mitigating system cornerstones. The inspectors performed a Phase 2 analysis using Appendix A, "Technical Basis For At Power Significance Determination Process," of Manual Chapter 0609, "Significance Determination Process," and the Phase 2 worksheets for the Wolf Creek Generating Station. Based on the results of the Phase 2 analysis, the finding is determined to have very low safety significance. The inspectors also determined that the finding has crosscutting aspects in the area of human performance associated with work practices because the operator's failure to use appropriate human error prevention techniques, such as self-checking, peer-checking, and the operator's choice to proceed in the face of uncertainty, resulted in a loss of coolant charging flow.

Inspection Report# : [2006004](#) (*pdf*)

Mitigating Systems

Significance:  Apr 07, 2007

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

Failure to implement fire protection impairment control permit requirements and compensatory measures

A self-revealing noncited violation of Technical Specification 5.4.1.d was identified for failure to implement fire protection impairment control permit requirements and compensatory measures when operators incorrectly disabled three fire detectors in the auxiliary building. The detectors in the auxiliary building were disabled without a proper fire impairment control permit and the required compensatory roving hourly fire watch for a period of approximately 5 hours as required by Administrative Procedure AP 10 103, "Fire Protection Impairment Control," Revision 21. This issue is captured in the licensee's corrective action program.

The failure to implement fire protection impairment control permit requirements and establish compensatory measures for the auxiliary building 1974' level was considered a performance deficiency. The inspectors determined that the finding was more than minor because it was associated with the Mitigating Systems cornerstone attribute of protection against external factors and affected the cornerstone objective of ensuring the availability of systems that respond to initiating events to prevent undesirable consequences. The finding was of very low safety significance because it involved compensatory measures for the fixed fire protection system and was assigned a low degradation rating since less than 10 percent of the fire detectors in the area were disabled. This finding has a crosscutting aspect in the area of human performance associated with the work practices component because the licensee failed to apply appropriate human error prevention techniques such as self and peer-checking prior to removing the fire detectors from service.

Significance:  Dec 31, 2006

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to implement the reactor vessel closure head installation procedure

The inspectors identified a noncited violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," involving the licensee's failure to properly implement the reactor vessel closure head installation procedure during Refueling Outage 15. Specifically, on October 30, 2006, the licensee performed Procedure FHP-02-007B, "Reactor Vessel Closure Head Installation," Revision 5. During the performance of Procedure FHP-02-007B, the licensee encountered problems with the polar crane that prevented the crane hoist from being lowered. The problems with the polar crane were encountered while the reactor vessel head was being transported along the North-South axis of the refueling cavity towards the reactor vessel. Consequently, the licensee transported the reactor vessel closure head approximately 3 feet over the reactor vessel flange while suspended approximately 4 feet above the operating deck. This condition was not allowed by procedure and exceeded the maximum analyzed height in the head drop analysis.

The failure to properly implement the reactor vessel closure head installation procedure was considered a performance deficiency. The finding was greater than minor because it affected the human performance attribute of mitigating systems cornerstone and the cornerstone objective to ensure the availability, reliability and capability of systems that respond to initiating events. Using Manual Chapter 0609 Appendix G, "Shutdown Operations Significance Determination Process" Phase 1 worksheets, the finding was found to be of very low safety significance because it did not affect decay heat removal or reactor coolant system inventory. The inspectors determined that the finding has crosscutting aspects in the area of human performance associated with work practices because the licensee failed to use appropriate human error prevention techniques, such as self, peer-checking and not proceeding in the face of uncertainty. The inspectors also determined that the finding has crosscutting aspects in the area of problem identification and resolution associated with operating experience because the licensee failed to effectively communicate internally generated lessons learned following the procedural noncompliance during the Refueling Outage 13 reactor vessel head installation.

Inspection Report# : [2006005](#) (pdf)

Significance:  Oct 07, 2006

Identified By: NRC

Item Type: NCV NonCited Violation

Inadequate inspections of potentially defective pressure transmitter

The inspectors identified a noncited violation of 10 CFR Part 50, Appendix B, Criterion V, regarding the failure to implement Administrative Procedure AP 28-011, "Resolving Deficiencies Impacting SSC's," Revision 1. Procedure AP 28-011 requires that, during the operability determination process, a reasonable expectation must exist that the structure, system, or component is operable and that the prompt determination process will support that expectation. Contrary to this requirement, "reasonable expectation" was not established for a deficiency affecting safety-related Barton pressure transmitters. The licensee entered this issue into their corrective action program as Condition Report 2006-000895.

The failure to implement Procedure AP 28-011 following identification of a potential degraded condition was a performance deficiency. This finding was more than minor because it affected the equipment performance attribute of the mitigating systems cornerstone and the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events. Using Manual Chapter 0609, "Significance Determination Process," Phase 1 worksheets, the inspectors determined that the finding is of very low significance because it did not represent a loss of a safety function or operability and was not potentially risk significant due to external events. The inspectors also determined that this finding has crosscutting aspects in the human performance area associated with decision making in that the licensee failed to use conservative assumptions in decision making and verify the validity of underlying assumptions for operability of the pressure transmitters, which resulted in indeterminate pressure transmitters remaining in service.

Inspection Report# : [2006004](#) (pdf)

Significance: TBD Dec 29, 2005

Identified By: NRC

Item Type: AV Apparent Violation

Failure to Maintain Reactor Coolant System Subcooling During the Alternative Shutdown

The team identified an Apparent Violation of Wolf Creek License Condition 2.C.(5)(a) concerning an inadequate alternative shutdown analysis. The licensee's alternative shutdown analysis was inadequate in that it used an acceptance criteria which was inconsistent with and less conservative than that required by the approved Fire Protection Program. The licensee developed Calculation Number AN-02-021, Revision 0, "OFN RP-017, 'Control Room Evacuation,' Consequence Evaluation", to demonstrate alternative shutdown capability for Wolf Creek in response to NRC-identified Noncited Violation 2002008-01, Inadequate alternative shutdown procedure. The calculation predicted that during an alternative shutdown, the reactor coolant system subcooling margin would not be maintained, significant voiding would occur in the core, and a steam void would form in the reactor vessel head. The licensee found the results of the calculation to be acceptable since it demonstrated that the void formation would be limited, natural circulation in the reactor coolant system would be maintained, sufficient decay heat removal would be maintained, and no fuel damage would occur. This is not consistent with the license condition to meet the technical requirements of 10 CFR Part 50, Appendix R. Section III.L of 10 CFR Part 50, Appendix R, "Alternative and dedicated shutdown capability", that states in part, "During the postfire shutdown, the reactor process variables shall be maintained within those predicted for a loss of normal a.c. power."

This finding is greater than minor 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 (i.e., core damage). It is the NRC's understanding that the licensee does not consider these circuit vulnerabilities to be violations of NRC requirements. The licensee considers the spurious operation of multiple components to be outside of the plant licensing basis for the Fire Protection Program. Specifically, in this case, both pressurizer power-operated relief valves are assumed to spuriously open because of fire induced circuit damage. 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# : [2005008](#) (*pdf*)

Significance: TBD Dec 29, 2005

Identified By: NRC

Item Type: AV Apparent Violation

Inadequate Alternataive Shutdown Procedure

The team identified an Apparent Violation of Technical Specification 5.4, Procedures, due to an inadequate alternative shutdown procedure that is required for implementation of the Fire Protection Program. The team found that some time critical actions required to safely shutdown the plant following a control room fire could not be accomplished within the required time periods. Specifically, the team found that the recommendations by Westinghouse Owners Group for assuring reactor coolant pump seal reliability and avoiding component cooling water thermal barrier water hammer concerns would not be met if the operators had to respond to multiple spurious operations. The procedure was developed and verified based on a time line assuming operators only have to respond to one spurious operation from the fire induced damage during the scenario. The team disagrees with this limitation of potential spurious operations.

This finding is greater than minor 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 (i.e., core damage). It is the NRC's understanding that the licensee does not consider these circuit vulnerabilities to be violations of NRC requirements. The licensee considers the spurious operation of multiple components to be outside of the plant licensing basis for the Fire Protection Program. 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# : [2005008](#) (*pdf*)

Barrier Integrity

Significance:  Apr 07, 2007

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to maintain steady state reactor power at or below the licensed thermal power limit

A noncited violation of Technical Specification 5.4.1.a occurred when operators did not take timely action to lower power below the licensed thermal limit of 3565 MWt. During an incore to excore neutron detector calibration, the power level exceeded the limit and the operating crew did not insert negative reactivity until after the neutron detector calibration was complete. During this evolution, the reactor exceeded licensed thermal power of 3565 MWt for approximately 58 minutes, peaking at 3566.5 MWt according to the plant computer's 10 minute calorimetric. After the neutron detector calibration was completed, operators added boron to the reactor coolant system to reduce power below 100 percent. Procedure GEN 00-004, "Power Operation," Attachment B, Step B.1.1 states, in part, that exceeding 3565 MWt is permitted only as a result of transients or computer point fluctuations. The inspectors judged that allowing reactor power to ascend above 100 percent for nearly an hour was not a transient. However, operators did not initiate action in accordance with Step B.1.1 when the 10 minute average exceeded 3565 MWt until approximately 40 minutes elapsed. This issue is entered into the corrective action program.

The failure to maintain steady state reactor power at or below the licensed thermal power limit is a performance deficiency. The finding was more than minor because it is associated with the configuration control attribute for the Barrier Integrity Cornerstone; and, it affected the cornerstone objective of providing reasonable assurance that physical design barriers (fuel cladding, reactor coolant system, and containment) protect the public from radio nuclide releases caused by accidents or events. The finding was of very low safety significance because the fuel cladding barrier was affected but did not affect the reactor coolant system or containment barriers. This finding has a crosscutting aspect in the area of human performance associated with the decision making component because the licensee did not ensure that licensed operators used conservative assumptions in their decision making when reactor power increased above the licensed limit for an extended period.

Inspection Report# : [2007002](#) (pdf)

Significance:  Apr 07, 2007

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to remove the correct containment radiation monitor from service

A self-revealing noncited violation of Technical Specification 5.4.1 occurred on February 20, 2007, when a chemistry technician inadvertently removed both containment purge radiation Monitors GTRE22 and GTRE33 from service at the same time. During planned maintenance on the safety-related GTRE33 containment purge radiation monitor, a chemistry technician inadvertently removed the incorrect containment purge radiation monitor from service. After contacting the control room, the shift chemist went to GTRE22 and incorrectly removed the radiation monitor from service. Instrumentation and controls personnel working at GTRE33 informed the shift chemist that the incorrect radiation monitor was removed from service. The shift chemist subsequently returned GTRE22 to service. Technical Specification 3.3.6, Condition A, was entered for having more than one train inoperable. The containment purge and supply dampers were immediately verified to be closed and remained closed with no containment purge in progress. This issue was entered into the licensee's corrective action program.

The inspectors determined that the failure to remove the correct containment radiation monitor from service was a performance deficiency. The finding was more than minor because it is associated with the configuration control attribute for the Barrier Integrity Cornerstone; and it affected the cornerstone objective to provide reasonable assurance that physical design barriers (fuel cladding, reactor coolant system, and containment) protect the public from radio nuclide releases caused by accidents for events. The finding was of very low safety significance because both trains of the radiation monitor protective functions (i.e., to stop a containment purge on a high radiation signal) were affected but did not result in an actual open pathway in the containment barrier. This finding has a crosscutting aspect in the area of human performance associated with the work practices component because the shift chemist failed to apply appropriate human error prevention techniques such as self and peer-checks.

Inspection Report# : [2007002](#) (pdf)

Significance:  Oct 07, 2006

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

Failure to completely close SFP valves resulted in a loss of SFP water inventory

A self-revealing noncited violation of Technical Specification 5.4.1.a was identified for the failure to close Valves

EC-V025 and -V033 during a lineup to recirculate the refueling water storage tank through the spent fuel pool cleanup system. These two systems were cross-connected for approximately 26 hours, which resulted in approximately 1200 gallons of spent fuel pool water being inadvertently transferred to the refueling water storage tank. The licensee entered this issue into their corrective action program as Condition Report 2006-000589.

The failure to completely close Valves EC-V025 and -V033 was a performance deficiency. This finding is more than minor because it is associated with the barrier integrity cornerstone attribute of configuration control and affected the cornerstone objective to maintain functionality of the spent fuel pool system. Using Manual Chapter 0609, "Significance Determination Process," Phase 1 worksheets, the inspectors determined that the finding is only of very low significance because the finding only affected the barrier function of the spent fuel pool. The inspectors also determined that the finding has crosscutting aspects in the area of human performance associated with work practices because the operators failed to use appropriate human error prevention techniques, such as peer-checking and not proceeding in the face of uncertainty. This led to 1200 gallons of spent fuel pool water being inadvertently transferred to the refueling water storage tank.

Inspection Report# : [2006004](#) (*pdf*)

Emergency Preparedness

Occupational Radiation Safety

Significance:  Apr 07, 2007

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

Failure to perform an adequate survey in a high radiation area

The inspector reviewed a self-revealing noncited violation of 10 CFR 20.1501(a) because the licensee failed to perform an adequate survey in a high radiation area. On March 7, 2007, a health physics technician performed a survey of Floor Drain Tank Room 7126 in the radwaste building to support a task performed by two radwaste operators. The health physics technician surveyed the immediate work area and informed the operators that general work area dose rates were 10 millirem per hour. Based on this information, operators entered the posted high radiation area on a radiation work permit that had an electronic dosimeter dose rate set point of 50 millirem per hour. One of the operators received a dose rate alarm while performing the task, the operators exited the area, and contacted health physics personnel. Subsequent investigation identified that a comprehensive survey of the entire room was not performed. Follow-up surveys indicated that dose rates in the room were as high as 150 millirem per hour at 30 centimeters from the floor drain tank. This issue has been entered into the licensee's corrective action program.

The finding was greater than minor because it was associated with the Occupational Radiation Safety Cornerstone attribute of Exposure Control, and affected the cornerstone objective because workers could have received additional radiation dose. The finding was processed through the Occupational Radiation Safety Significance Determination Process and 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 has a crosscutting aspect in the area of human performance related to work controls because the failure to incorporate job site conditions impacted the margin of radiological safety provided by an adequate survey.

Inspection Report# : [2007002](#) (*pdf*)

Significance:  Dec 31, 2006

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to provide instructions to workers

The inspector identified a noncited violation of 10 CFR 19.12(a)(2) because the licensee failed to provide instructions to a worker on how to minimize exposure while working with radioactive material and contaminated equipment.

Specifically, on October 18, 2006, a worker on the Steam Generator A platform received an intake of Cobalt-58 while removing contaminated conduit from the primary side of the steam generator and placing it in a radioactive material bag for storage. The worker was wearing a face shield; however, the inspector identified that the licensee failed to provide the worker with instructions on how to minimize exposure to radioactive material while performing this task. The licensee's corrective actions included providing workers with powered face shields that blow air away from the face. This finding was entered into the licensee's corrective action program.

The finding was greater than minor because it was associated with the Occupational Radiation Safety Cornerstone attribute of Exposure Control, and affected the cornerstone objective to ensure the adequate protection of a worker's health and safety from exposure to radioactive materials because a worker received an unintended internal dose. The finding was processed through the Occupational Radiation Safety Significance Determination Process and determined to be of very low safety significance because it was not 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 has a cross-cutting aspect in the area of human performance related to work practices because the licensee did not ensure supervisory oversight of work activities such that exposure to radioactive material was minimized and properly controlled.

Inspection Report# : [2006005](#) (*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:  Apr 07, 2007

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to maintain sufficient records to furnish evidence of events significant to plant safety

A noncited violation of Technical Specification 5.4.1.a was identified for failure to maintain sufficient records (logs) to furnish evidence of events significant to plant safety. On January 26, 2007, electrical maintenance commenced a scheduled replacement of main control board Annunciator Power Supply E1PS5. During the power supply replacement, a loss of 8.7 percent of the annunciators was expected. However, during de-termination of the power supply leads, an unexpected loss of a significant number of the main control board annunciators occurred. Subsequently, due to the large number of annunciator inputs that were lost, the plant computer became overloaded and stopped updating. Based on these indications, the control room operators would need to evaluate emergency action level and Technical Specification requirements. The inspectors discovered during interviews with the operations crew that was on watch during the event, that no information was recorded or kept during the event. Administrative Procedure AP 21-001, "Conduct of Operations," Revision 36A, requires operators to make plant log entries of potentially reportable occurrences, entries that could be useful in reconstructing events, and events significant to plant safety. However, the logs were not updated until several hours later based on verbal accounts provided to the oncoming crew. The inspectors noted that the 'after the fact' log entries still provided insufficient data to reconstruct the activities related to the loss of annunciators. This issue is captured in the licensee's corrective action program. The failure to adequately document times and information for the loss of annunciators was considered to be a performance deficiency. This finding was more than minor because it could impact the operator's ability to accurately implement emergency action levels and Technical Specification action statements and if left uncorrected, this type of insufficient documentation could become a more significant safety concern. The finding required NRC management

review and was determined to be of very low safety significance because the loss of annunciators challenged the emergency action level time requirements but was restored prior to exceeding any emergency action level or Technical Specification action time requirement. This finding has a crosscutting aspect in the area of human performance associated with the work practices component because the licensee failed to effectively communicate expectations regarding plant operating log entries in accordance with procedural requirements.

Inspection Report# : [2007002](#) (*pdf*)

G

Significance: Apr 07, 2007

Identified By: Self-Revealing

Item Type: FIN Finding

Failure to maintain drawings technically accurate

A self-revealing finding was identified regarding inadequate engineering drawings used as guidance to replace main control board annunciator power supplies resulting in a loss of all main control board annunciators. During de-termination of the power supply leads, an unexpected loss of a significant number of the annunciators occurred. During the planning review of Work Order 06 280217 003, "Replace Power Supply RK045E1PS5," the electricians brought forth a concern about the daisy chaining of the leads associated with the main control board power supplies and not knowing what effect removing a power supply would have on additional annunciators. System engineering reviewed vendor drawings and determined that only the expected annunciators would be lost. The vendor drawings only consisted of discrete wire connections from the power supply to the logic bus and did not show interconnections with any other power supplies. Although, it was acknowledged by system engineering that there were numerous daisy chained connections not shown on the vendor drawings, no further reviews or research was conducted. The licensee's root cause analysis determined that the vendor drawings did not show the interconnecting wiring identifying point to point connections associated with the main control board power supplies. This issue is captured in the licensee's corrective action program.

The failure to maintain drawings technically accurate and reflect the as-built condition of the plant was considered to be a performance deficiency. The finding was more than minor because it impacted the maintenance technicians ability to accurately plan and implement work, resulting in the annunciator system being adversely affected and could be reasonably viewed as a precursor to a significant event. The finding required NRC management review and was determined to be of very low safety significance because the finding did not result in a loss of a system safety function or a loss of risk significant equipment for greater than 24 hours. This finding has a crosscutting aspect in the human performance area associated with the resources component because the licensee failed to maintain complete, accurate and up-to-date design documentation.

Inspection Report# : [2007002](#) (*pdf*)

Last modified : August 24, 2007