

Wolf Creek 1

3Q/2008 Plant Inspection Findings

Initiating Events

Significance:  Jun 28, 2008
Identified By: Self-Revealing
Item Type: FIN Finding

Inadequate transformer procedure resulted in an unplanned reactor trip and forced outage

A self-revealing finding was identified for an inadequate maintenance procedure that resulted in a reactor trip due a loss of all condensate pumps. On March 17, 2008, plant operators observed that steam generator water level was lowering and main feed pump speed was decreasing. Based on these indications, Wolf Creek operators manually tripped the plant. Approximately 12 hours prior to the transformer trip, Wolf Creek had removed from service XPB04 transformer for planned maintenance and cross connected XPB04 transformer PB004 bus loads to the XPB03 transformer PB003 bus. This arrangement powered all three condensate pumps from PB003 4.16kv bus. The licensee's investigation of the cause of the transformer trip determined that two phases of the XPB03 transformer 4.16kv output cables had overheated and failed because two multi-directional conductor connectors used to terminate two phases of the 1000 MCM 4.16kv bus cables were installed using the incorrect configuration. The resident inspectors reviewed Work Order 06-291275-000, Revision 0, in which the licensee had performed maintenance on the XPB03 transformer on March 4, 2008, that required removal of the XPB03 transformer 4.16kv output cables. The work order provided general guidance to disconnect the high/low side. The inspectors noted that neither the work order nor Procedure MTE TL-001 contained any guidance or specified the conductor connector configuration and only provided general guidance to disconnect and re-term the cables. It was also noted that this work was performed by first time performers who had no experience with this type of connector. The inspectors reviewed electrical maintenance training and did not identify any training that would have provided knowledge or skills on multi-directional conductor connectors.

The finding was more than minor because it is associated with the procedure quality attribute of the initiating events cornerstone and it affected the cornerstone objective to limit the likelihood of those events that upset plant stability. This finding also affected the procedure quality attribute for the mitigating systems cornerstone and it affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). The inspectors evaluated the significance of this finding and because two cornerstones were affected, a Phase 2 analysis was required. The consequences were assessed using a Phase 3 analysis by the Region IV senior reactor analyst. The consequence of the performance deficiency was a reactor trip with a loss of normal feedwater. This event occurred 13 days following maintenance using the flawed procedure. Consequently, the finding was determined to be of very low safety significance. This finding has human performance crosscutting aspects in the area associated with resources component because the licensee failed to provide an adequate maintenance procedure to assure nuclear safety [H.2(c)].

Inspection Report# : [2008003](#) (*pdf*)

Significance:  Dec 31, 2007
Identified By: Self-Revealing
Item Type: FIN Finding

Inadequate work instructions resulted in condensate pump trip

A self-revealing finding was identified for inadequate work instructions and poor work practices associated with trip circuit verification on the Central Chiller B resulted in the Condensate Pump B trip and steam generator level transient. Procedure RNM C-1301, "Miscellaneous Relay and Meter equipment," Revision 6, step 8.3.2.8.h of RNM C-1301 required in part that a jumper be installed from Terminals 3 to 4 on Relay 194 at Breaker PB00402 for the Central Chiller B (wire C280 and C281) which resulted in Condensate Pump B trip. However, this step was copied from a previous work order and not verified as appropriate for the testing being conducted. Step 8.3.2.8.h should have read in part to install jumpers from Terminals 7 to 8 (wire C284 and C285). Licensee reviews and walkdowns were inadequate to identify the incorrect instructions due to workload, interruptions and distractions during the review process. The evaluation also identified Performance Improvement Request 2002-1664 which discussed a similar event where copied information in a work order was incorrect and not identified in reviews. Corrective actions for this event included adding sign-off sections in RNM C-1301 for walkdowns/reviews to ensure work instructions were reviewed before work was performed.

The failure to provide adequate work instructions is a performance deficiency. This finding was more than minor because it is associated with the procedure quality attribute of the Initiating Events cornerstone and it affected the cornerstone objective to limit the likelihood of those events that upset plant stability. This finding also affected the procedure quality attribute for the Mitigating Systems Cornerstone and it affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). Because two cornerstones were affected a Phase 2 analysis was required. The consequences were assessed using the Phase 2 pre-solved tables with the assistance of a Region IV Senior Reactor Analyst. Although the likelihood of a trip was increased and the capability of the normal heat sink was reduced, the exposure time for this condition was less than 3 days and all other mitigation capabilities were maintained. Consequently, the finding was determined to be of very low safety significance. The cause of the finding has human performance crosscutting aspects in the area associated with work practices because the licensee failed to ensure that human error prevention techniques such as self/peer-checking and proper documentation of activities were used in the review of work

activities such that they are performed safely (H.4(a)).

Inspection Report# : [2007005](#) (*pdf*)

Mitigating Systems

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Significance: Jun 28, 2008

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to implement transient combustible control permit requirements for a propane tank

A noncited violation (NCV) TS 5.4.1.d was identified for failing to control combustible materials in an area of the plant that contained safety related equipment. During a walkdown on May 1, 2008, inspectors noted that a temporary propane cylinder for a generator contained 33.5 pounds of propane. The inspectors identified that the propane cylinder did not have a transient combustible materials permit. Operators informed the inspectors that there were no active permits or impairments for this propane cylinder. The operators further stated that no such actions would be necessary because the generator and its propane cylinder are exempted from permit controls. The inspectors reviewed Procedure AP 10-102, "Control of Combustible Materials," Revision 13. Section 7.10 of this procedure stated that the, "propane cylinder... is exempt from the transient combustible permit requirements of this procedure." Section 6.2.1 also states, in part, that a transient combustible materials permit is required if two gallons of flammable liquid or 14 pounds of flammable gas (not connected with hot work) are used. The inspectors spoke with Wolf Creek fire protection and licensing personnel and expressed that there seemed to be an inadequacy in their fire protection program. These personnel stated that their exemption of the propane was a long standing policy of the station and fire protection plan. The inspectors contacted NRC regional fire protection specialists. The specialists informed the inspectors that Wolf Creek's position was contrary to industry standards and practice. The specialists stated that industry standards also consider heat of combustion or fire load, and a potential fire hazard and combustible characteristics of a material, i.e., an explosion. The inspectors determined that the licensee's interpretation that the propane cylinder should be exempted from permit requirements was inappropriate.

The inadequate control of transient combustibles in containment was more than minor because, if left uncorrected, it would become a more significant-safety concern and could potentially affect residual heat removal availability due to fire under the mitigating systems cornerstone. The finding was of very low safety significance because the finding was assigned a moderate degradation factor and the issue only affected the ability to achieve and maintain cold shutdown. The finding also had crosscutting aspects in the problem identification and resolution area associated with corrective actions because the licensee failed to take appropriate corrective actions for a previous NRC identified deficiency in the exempted use of Class A transient combustibles [P.1(d)].

Inspection Report# : [2008003](#) (*pdf*)

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Significance: Jun 28, 2008

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to establish goals and monitor for a(1) ECCS room

An NCV of 10 CFR 50.65(a)(1) was identified by the inspectors for failure to establish a(1) goals for the safety-related room coolers and monitor room cooler performance against those goals. On May 5, 2005, the Train A residual heat removal pump accumulated enough unavailability time to exceed the 10 CFR 50.65 a(2) goal due to a 0.5 gpm through wall leak on Room Cooler SGL10A. The licensee wrote Performance Improvement Request (PIR) 2005-2507 on August 31, 2005, to document that the maintenance rule expert panel had a majority vote to move the room cooler function to a(1) status. In the coming years, the replacement schedule defined prior to PIR 2005 2507 was delayed several times. PIR 2005-2507, Action Item 4, required the expert panel to establish a(1) monitoring goals with a monitoring duration by June 30, 2006. Wolf Creek performed a 10 CFR 50.65 a(3) review on April 27, 2007, to determine if the room cooler performance was disproportionate to its established a(2) goals. The April 27, 2007, expert panel meeting minutes, in part, states that a(1) goals had not been established because all of the room coolers had not been replaced and after all room coolers are replaced, that a(1) goals and monitoring will be implemented in the future. Inspectors questioned this practice of only monitoring for performance after corrective action rather than before and after corrective action. Thus, no technically justified goals were established. The inspectors questioned the process of considering the Function a(1) for 3 years of corrective actions with no a(1) monitoring goals in the intervening time. After inspector questioning in February 2008, Wolf Creek has expedited room cooler procurement and replacement. The inspectors also determined that the replacement plan did not implement maintenance activities, which would improve the availability of the systems. This was contrary to the guidance in NUMARC 93-01, "Industry Guideline for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," Revision 3, which states that while waiting to implement modifications, increased preventive maintenance may be necessary to ensure the affected function will remain reliable.

This finding is more than minor because it is consistent with Inspection Manual Chapter 612, Appendix E, Example 7.a. Specifically, Wolf Creek failed to establish a(1) goals and monitor performance against those goals for the a(1) GL-5 function for 3 years. The inspectors evaluated the significance of this finding and determined that the finding is of very low safety significance because the support function (GL-5) to cool pump rooms does not result in a total loss of any safety function as identified by the licensee probability risk assessment that contributes to external event initiated core damage accident sequences (i.e., initiated by a seismic, flooding, or severe weather event). The finding has a crosscutting aspects in the problem identification and resolution area associated with corrective action program because Wolf Creek failed to take appropriate corrective actions to address this safety issue and the adverse room cooler trends in a timely manner,

commensurate with safety significance and complexity [P.1(d)].

Inspection Report# : [2008003](#) (*pdf*)

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Significance: Jun 28, 2008

Identified By: NRC

Item Type: NCV NonCited Violation

Inadequate containment sump inspection procedure

The inspectors identified an NCV of 10 CFR Part 50, Appendix B, Criterion V, "Procedures, Instructions, and Drawings," for Wolf Creek's failure to specify acceptance criteria in its containment sump inspection procedure which led to unidentified gaps in containment Sump A. During a Mode 4 containment walkdown on May 9, 2008, the inspector identified a gap in containment Sump A not previously identified by Wolf Creek. Based on previous Engineering Disposition 12684, the gap acceptance criterion was 0.045 inch. The gap that the inspector identified was 1/8-inch wide by 1/2-inch tall on one of the upper sump strainers. After raising the issue to the control room, Wolf Creek declared containment Sump A inoperable and entered TS 3.5.3. Train B residual heat removal was already inoperable for maintenance. Wolf Creek subsequently entered Technical Specification 3.0.3, and repaired the sump. Wolf Creek Procedure STS EJ 003, "Containment Sump Inspection" Revision 14, Step 8.1, contains no guidance on filter screen gap acceptance criteria, other than "verify no evidence of structural distress." Wolf Creek last implemented STS EJ-003 during their May 7, 2008, walkdown prior to ascending from Mode 5 to Mode 4. The inspectors considered this a missed opportunity as Wolf Creek should have identified these deficiencies prior to Mode 4. Although the inspectors could not determine with complete certainty that the sump screen gap existed at the time of Wolf Creek's walkdown on May 7, Wolf Creek was not able to identify any work activity performed in the recirculation sump area since that time.

The finding was more than minor because it affected the procedure quality and human performance attributes of the mitigating systems cornerstone objective to ensure the availability, reliability, and capability of systems that responds to initiating events and prevent undesirable consequences. The inspectors determined that the finding was of very low safety significance because the deficiency did not result in the complete loss of operability or functionality and did not represent a risk significant external event such as flooding. The finding has human performance crosscutting aspects in the area associated with resources. Specifically, Wolf Creek did not ensure that Procedure STS EJ-002 was adequate to assure nuclear safety including complete, accurate and up-to-date specifications or acceptance criteria for the sump [H.2(c)].

Inspection Report# : [2008003](#) (*pdf*)

G

Significance: Jun 28, 2008

Identified By: Self-Revealing

Item Type: FIN Finding

Inadequate switchyard work procedure resulted in a loss of offsite power

A self-revealing finding was identified for an inadequate Wolf Creek switchyard maintenance work instruction which resulted in the loss of offsite power. On April 7, 2008, offsite power was lost to the NB02 4 kV safety-related bus when switchyard workers tripped the incorrect "breaker failure" trip relay while testing the Rose Hill 345kV offsite switchyard breakers. The incorrect closed trip relay made up the logic for the startup transformer protection circuit and extended the trip signal to all 345kV offsite breakers, resulting in the loss of power. The loss of the switchyard bus de-energized the "protected train," 4 kV Bus B. The emergency diesel generator automatically started and supplied power to the Train B bus. Offsite power was restored to Train B bus approximately 8 hours later. The plant was defueled for a refueling outage and NB01 bus was secured for maintenance. The inspectors noted that the work orders only provided generic instructions and did not contain any detailed information or any specific step-by-step instructions on how the work was to be conducted. It was also noted that the switchyard workers did not have a copy of the maintenance procedure in hand and was on the phone with another switchyard worker who coordinated/directed the work. Administrative Procedure AP 21C-001, "WCGS/WESTAR Substation," Revision 8, in part, contains steps for the Wolf Creek switchyard coordinator to review and monitor switchyard activities; and prepare a substation work authorization which describes the type of work to be performed and oversight of work needed. This review process is to ensure control of maintenance which could affect the availability of offsite power. AP 21C-001 also contains guidance that if either NB bus is de-energized, then work should not be performed that could jeopardize power to the inservice NB bus. However, this review did not catch the inadequate instructions provided to the workers nor prevented work that jeopardized power to the inservice NB bus.

This finding is greater than minor because the availability and reliability of a safety-related 4 kV bus was challenged when offsite power was lost. This finding was also associated with the equipment performance attribute of the mitigating systems cornerstone and affected the objective to ensure availability and reliability of systems that respond to initiating events to prevent undesirable consequences. The finding was determined to be of very low safety significance because the finding did not increase the likelihood of a loss of reactor coolant system inventory, degrade the ability to terminate a leak path or add reactor coolant system inventory when needed during shutdown operations. This finding had human performance crosscutting aspects in the area of resources because personnel did not have adequate procedures and work instructions for switchyard maintenance to ensure that the trip relay testing would not create an inadvertent loss of offsite power [H.2(c)].

Inspection Report# : [2008003](#) (*pdf*)

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Significance: Jun 28, 2008

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to verify engineering design calculation prior to use

The inspectors identified an NCV of 10 CFR Part 50, Appendix B, Criterion III (Design Control) for failure to implement engineering procedures and approve a third party calculation prior to use at Wolf Creek. Specifically, the calculation review failed to identify the incorrect design inputs to the net positive suction head calculations on two occasions for residual heat removal and containment spray. On October 5, 2006, Wolf Creek engineering approved Design Change Package 011295 which accepted the associated vendor calculation, TDI 6002 05, Revision 0, for clean strainer head loss as a design analysis calculation for the new containment sump. On January 22, 2008, an operability evaluation documented design errors that created unacceptable reductions in margin-to-net positive suction head requirements for core cooling components associated with the already installed containment recirculation sump strainer modification. Revision 0 of the calculation had omitted the head loss component associated with the as built orifices located in the strainer support plate. The size of the orifice beneath each strainer was not large enough to prevent head loss in excess of the net positive suction head required per the design conditions defined in the purchase specification supplied to the strainer vendor. This resulted in required net positive suction head being less than available. On three separate reviews, Wolf Creek engineering accepted the vendor calculation without completely evaluating the calculation as acceptable in accordance with Wolf Creek plant procedures. Administrative Procedure AP 05D 001, "Calculations," Revision 11, Step 6.11.3, states, in part, that design analysis calculations shall be reviewed and accepted by engineering prior to being used to support plant design or operability. This review shall compare calculations to design inputs, verify assumptions, verify analytical methods, verify accuracy and ensure compliance with design criteria. Contrary to the above, the licensee acceptance review of Revision 0 of the calculation failed to identify incorrect design inputs to the as built orifice size and Revisions 1 and 2 failed to identify the nonconservative temperature correction prior to being accepted.

This finding was more than minor because they were similar to non-minor Example 3.j from NRC Inspection Manual Chapter 0612, Appendix E, "Examples of Minor Issues," in that, there was a reasonable doubt on the operability of the residual heat removal and containment spray pumps; and if left uncorrected, could result in a more significant safety concern. The finding is of very low safety significance because it was a qualification deficiency confirmed not to result in loss-of-operability in accordance with NRC Manual Chapter Part 9900, Technical Guidance, "Operability Determination Process for Operability and Functional Assessments." The finding had a problem identification and resolution area crosscutting aspects in the corrective action program component, because the site failed to perform a thorough evaluation of vendor calculations to ensure conditions adverse to quality are identified and resolved [P.1(c)].

Inspection Report# : [2008003](#) (*pdf*)

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Significance: Apr 07, 2008

Identified By: NRC

Item Type: NCV NonCited Violation

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

The inspectors identified a noncited violation of Technical Specification 5.4.1.d for failure to implement fire protection impairment control permit requirements and compensatory measures when operators received a trouble alarm on a fire detector in the auxiliary building. On January 26, 2008, operators discovered that Detector KC-104-XCH-ID-006 did not have a fire protection impairment control permit. This detector was adjacent to Detector KC-104-XSH-ID-007 which was already inoperable in Impairment 2008-020. The licensee's administrative procedure required fire detection in the area to be declared inoperable if two adjacent detectors are inoperable. This condition existed for approximately 24 hours and would have required a compensatory continuous fire watch for the period that both detectors were inoperable. The residents identified that the control room turnover checklist contains a section for listing the KC008 alarms; however, the two turnover checklists for the two shifts following the initial alarm did not identify Detector KC 104 XCH ID 006 as a Detector KC 008 alarm. The failure to implement fire protection impairment control permit requirements and establish compensatory measures for the auxiliary building 2026-foot level was considered a performance deficiency. 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. Specifically, this issue relates to the protection against fire example of protection against external factors attribute because the detectors were inoperable without ensuring compensatory measures were in place. 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. The finding has crosscutting aspects in the area of human performance associated with work practices because the licensee failed to apply appropriate human error techniques such as self and peer checking techniques to avoid committing errors [H.4(a)].

Inspection Report# : [2008002](#) (*pdf*)

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Significance: Apr 07, 2008

Identified By: NRC

Item Type: NCV NonCited Violation

Performing prohibited elective maintenance on offsite power during EDG maintenance

- An NRC identified a noncited violation of Technical Specification 3.8.1.B.4 resulted from Wolf Creek removing equipment from service that was prohibited by the TS. Inspectors reviewed Technical Specification Bases 3.8.1.B.4 which prohibits elective maintenance within the switchyard that would challenge offsite power. Inspectors also reviewed the NRC Safety Evaluation Report for the 7 day emergency diesel generator allowed outage time (Technical Specification 3.8.1.B.4.2.2) and found that Section 4.6.c, states: "The offsite power supply and switchyard conditions are conducive to an extend[ed] DG [completion time], which includes ensuring that switchyard access is restricted and no elective maintenance within the switchyard is performed that would challenge the offsite power availability." The inspectors determined that challenges to offsite power can originate with elective maintenance inside the protected area.

The inspectors determined that the failure to implement requirements of the NRC Safety Evaluation Report and Technical Specification Bases for Technical Specification 3.8.1.B.4 was a performance deficiency. The finding was more than minor because it is associated with the

equipment performance attribute for the Mitigating Systems Cornerstone; and, it affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). The finding was determined to be of very low safety significance because the issue resulted in the Train B offsite power being inoperable, but capable of supplying the safety bus for greater than 24 hours. Additionally, the cause of the finding has a human performance crosscutting aspects in the area associated with work control. Specifically, Wolf Creek did not ensure STS IC-805B was appropriately coordinated within organizations to assure plant and human performance during the extended emergency diesel generator allowed outage time. [H.3(b)]

Inspection Report# : [2008002](#) (*pdf*)

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Significance: Apr 07, 2008

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to establish reasonable expectation of operability

- An NRC identified NCV of Technical Specification 5.4.1 for failure to follow the operability process on discovery of the CCP A room cooler leak. Wolf Creek made no log entries at 2:20 p.m. stating its basis for immediate operability. At 3:50 p.m., Wolf Creek control room logs state that centrifugal charging Pump A had a room cooler leak and structural integrity cannot be verified. Subsequent entry into Technical Specification 3.7.8 for the essential service water Pump A caused emergency diesel Generator A to be inoperable. Technical Specification 3.8.1, Condition I states that with three alternating current sources inoperable (both emergency diesel generators and on offsite source), Technical Specification 3.0.3 shall be entered. Wolf Creek exited Technical Specification 3.0.3 at 4:13 p.m. when the inlet and outlet valves to centrifugal charging Pump A's room cooler were closed. The inspectors could not locate any justification produced by Wolf Creek for the room cooler's operability after 2:20 p.m.

The inspectors determined that the failure to follow the operability process is a performance deficiency. The inspectors determined that this finding was more than minor because if left uncorrected, it could become a more serious problem if the Technical Specification is not correctly applied. The finding screened to Phase 2 because the finding represents an actual loss of safety function of a single train of high head injection. A bounding risk of Green results from the Phase 2 presolved worksheets using an exposure time of less than 3 days for the centrifugal charging pump (CCP) A [Fails to Run]." The inspectors also determined that the finding had a human performance crosscutting aspects in the area associated with decision making because the licensee failed to use conservative assumptions in its operability decision and apply a requirement to demonstrate that the room cooler is operable is in order to proceed rather than a requirement to demonstrate that it is inoperable [H.1(b)].

Inspection Report# : [2008002](#) (*pdf*)

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Significance: Apr 07, 2008

Identified By: NRC

Item Type: NCV NonCited Violation

Untimely corrective actions for CCP room cooler leads to NOED

The inspectors identified a noncited violation of 10 CFR Part 50 Appendix B Criterion XVI, "Corrective Action," because Wolf Creek failed to take timely corrective actions to prevent failure of the centrifugal charging pump A room cooler which resulted in a Notice of Enforcement Discretion (EA 08 052). The inspectors found that room Cooler SGL12A experienced leaks in October 1999, May 2003, October 2003, August 2004, October 2006, and again in February 2008. On March 14, 2007, Wolf Creek chose to delay SGL12A's replacement until Refueling Outage 16 due to the required length of time to replace the cooler. On February 13, 2008, a circumferential flaw on an H bend was discovered in SGL12A preventing it from performing its safety function. Inspectors reviewed corrective action Procedure AP 28A-100, "Condition Reports," Revision 3 and found that a loss of a train to perform its safety function was considered a significant deficiency requiring corrective action to prevent recurrence. The inspectors reviewed this issue under Performance Improvement Requests 2005-2507 and 2004-0688, and Condition Report 2008-0467 and found that Wolf Creek designated prior failures nonsignificant.

The failure to take timely corrective actions within 9 years was a performance deficiency. The inspectors determined that this finding was more than minor because it is associated with the equipment performance attribute for the mitigating systems cornerstone; and, it affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e. core damage). The finding screened to Phase 2 because the finding represents an actual loss of safety function of a single train of high head injection for greater than its Technical Specification 3.8.1.B.2 allowed outage time of 4 hours. Using an exposure time of less than 3 days for the scenario "Centrifugal Charging Pump PBG05A [Fails to Run]," a bounding risk of Green results from the Phase 2 presolved worksheets. Additionally, the cause of the finding has a human performance crosscutting aspect in the area associated with resources. Specifically, Wolf Creek did not ensure adequate resources to maintain long-term plant safety by minimizing the room coolers' long-standing issues and preventive maintenance deferrals [H.2(a)].

Inspection Report# : [2008002](#) (*pdf*)

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Significance: Apr 07, 2008

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to reestablish timely seal cooling for the reactor coolant pumps

- An NRC identified violation of Technical Specification 5.4.1.d resulted because Procedure OFN RP 017, "Control Room Evacuation,"

Revision 21, failed to account for the needed actions to reestablish reactor coolant pump seal cooling. Failure to reestablish seal cooling in a timely manner could have resulted in a small break loss of coolant accident.

This performance deficiency resulted from an inadequate postfire safe shutdown procedure. The inspectors determined 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 attribute of protection against external factors (e.g., fire). This finding affected 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. In addition to the control room fire requiring operators to evacuate the control room, the fire would have had to affect components located in two physically separated panels. The licensee has IEEE 383 qualified cables and conductors throughout the plant. The Phase 3 risk evaluation performed by the NRC senior reactor analyst determined this deficiency had very low risk significance.

Inspection Report# : [2008002](#) (*pdf*)



Significance: Apr 07, 2008

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to analyze motor operated valve circuits

- The inspectors identified a noncited violation of License Condition 2.c(5) because the licensee failed to evaluate the impact of a motor operated valve failure mechanism on their ability to implement postfire safe shutdown following a control room evacuation. The licensee determined that the failure mechanism affected 38 motor operated valves and upon valve failure could affect their ability to implement their postfire safe shutdown procedure. A short circuit that bypassed the torque and/or limit switches could damage the valves and prevent repositioning of the valve in the postfire safe shutdown position.

The inspectors determined this was a performance deficiency because the licensee failed to ensure that components necessary to safely shutdown the reactor would remain operable following a fire. This deficiency was more than minor, in that, it had the potential to impact 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. In addition to the control room fire requiring operators to evacuate the control room, the fire would have had to affect components located in five different control panels. The Phase 3 risk evaluation performed by the NRC senior reactor analyst determined this deficiency had very low risk significance.

Inspection Report# : [2008002](#) (*pdf*)



Significance: Mar 13, 2008

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to Vent ECCS Piping Every 31 days

The team identified two examples of a noncited violation of Technical Specification Surveillance Requirements 3.5.2.3 for the failure to vent emergency core cooling system discharge piping. In the first example, the licensee had inappropriately concluded that inaccessible vents included all those vents located in posted high radiation areas, but either no high radiation field existed in the area or personnel would not be exposed to high radiation dose. The second example involved the failure to perform the surveillance in accordance with the 31 days required frequency. When the surveillance was conducted, gas was observed coming from a SI system hot leg injection line vent.

Both violation examples were more than minor because they were similar to non-minor examples 4.m from NRC Inspection Manual Chapter 0612, Appendix E. "Examples of Minor Issues," in that, when the surveillances were completed, unexpected amounts of gas were found the piping systems. Some sections were totally voided. Using the Manual Chapter 0609, "Significance Determination Process," Phase 1 Screening Worksheet, the issue screened as having very low safety significance because it was a qualification deficiency confirmed not to result in loss-of-operability in accordance with NRC Manual Chapter Part 9900, Technical Guidance, "Operability Determination Process for Operability and Functional Assessment." The finding had a crosscutting aspect in the Human Performance, Resources component, because the licensee failed to have an adequate surveillance procedure that included all necessary ECCS vent values. These findings were indicative of current performance because operators, who are familiar with the TS requirements and Bases commitments, could have questioned, at any time, the practice of eliminating accessible values from the venting program. [H.2(c)]

Inspection Report# : [2008007](#) (*pdf*)



Significance: Mar 13, 2008

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to Promptly Identify and Correct Voiding in the Safety Injection System

The team identified a noncited violation of 10 CFR Part 50, Appendix B, Criterion XVI (Corrective Actions), with five examples, for the failure to promptly identify and correct voids in safety injection system. In some cases, significant changes in the safety injection tank leakage rates went unnoticed. Safety injection tank leakage can be a key indicator that voids are forming in lower pressure systems. In other examples, unexpected amounts of gas came from safety injection piping vents but operators and engineers failed to take meaningful actions to investigate or to address the occurrences. Contributors to the violation included: (1) the failure to properly address two pieces of related operating experience, (2) management's failure to follow site procedures and ensure that operating experience reviews were adequate, (3) the emergency core cooling system monthly venting procedure contained inadequate acceptance criteria, and (4) engineers were not adequately

monitoring safety injection tank leakage.

This finding was more than minor because it was similar to non-minor example 3.j from NRC Inspection Manual Chapter 0612, Appendix E, "Examples of Minor Issues," in that there was a reasonable doubt on the operability of the Train A safety injection system and the steam generators. Using the Manual Chapter 0609, "Significance Determination Process," Phase 1 Screening Worksheet, the issue screened as having very low safety significance because it was a qualification deficiency confirmed not to result in loss-of-operability in accordance with NRC Manual Chapter Part 9900, Technical Guidance, "Operability Determination Process for Operability and Functional Assessments." The finding had a crosscutting aspect in the Problem Identification and Resolution area, Operating Experience component, because the site had not institutionalized operating experience. This finding was indicative of current plant performance because the weaknesses in the operating experience program that permitted the inadequate review of operating experience were still in place at the time of this inspection. [P.2(b)]

Inspection Report# : [2008007](#) (*pdf*)

Significance:  Mar 13, 2008

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to Promptly Identify and Correct Voids in ECCS Suction Piping

The team identified a noncited violation of 10 CFR Part 50, Appendix B, Criterion XVI (Corrective Actions), because the licensee failed to promptly identify and correct voids in emergency core cooling system suction piping. After NRC concerns were raised, the licensee checked the suction piping and found voids in the piggyback lines (between residual heat removal discharge piping and charging and safety injection suction headers) and in shutdown cooling suction piping. Contributors to the violation included: (1) the failure to properly address two pieces of related operating experience, (2) management's failure to follow site procedures and ensure that operating experience reviews were adequate.

This finding was more than minor because it was similar to non-minor example 3.j from NRC Inspection Manual Chapter 0612, Appendix E, "Examples of Minor Issues," in that there was a reasonable doubt on the operability of the Train A safety injection system and the steam generators. Using the Manual Chapter 0609, "Significance Determination Process," Phase 1 Screening Worksheet, the issue screened as having very low safety significance because it was a qualification deficiency confirmed not to result in loss-of-operability in accordance with NRC Manual Chapter Part 9900, Technical Guidance, "Operability Determination Process for Operability and Functional Assessments." The finding had a crosscutting aspect in the Problem Identification and Resolution area, Operating Experience component, because the site had not institutionalized operating experience. This finding was indicative of current plant performance because the weaknesses in the operating experience program that permitted the inadequate review of operating experience were still in place at the time of this inspection.[P.2(b)]

Inspection Report# : [2008007](#) (*pdf*)

Significance:  Mar 13, 2008

Identified By: NRC

Item Type: NCV NonCited Violation

Inadequate RHR and CS Void Calculations

The team identified a noncited violation of 10 CFR Part 50, Appendix B, Criterion III (Design Control), for an inadequate calculation involving previously identified voids in the residual heat removal and containment spray containment suction piping. A contract engineer relied solely on engineering judgment to determine that the void stream, up to 11 percent, would have no effect on pump performance. Test data from an NRC NUREG, that the licensee had also used, contradicted the contractor's assessment. A contributor to this violation was the licensee's poor understanding of information contained in the NUREG.

This finding was more than minor because it was similar to non-minor example 3.j from NRC Inspection Manual Chapter 0612, Appendix E, "Examples of Minor Issues," in that there was a reasonable doubt on the operability of the residual heat removal and containment spray pumps. Using the Manual Chapter 0609, "Significance Determination Process," Phase 1 Screening Worksheet, the issue screened as having very low safety significance because it was a qualification deficiency confirmed not to result in loss of operability in accordance with NRC Manual Chapter Part 9900, Technical Guidance, "Operability Determination Process for Operability and Functional Assessments." The finding had a crosscutting aspect in the Problem Identification and Resolution area, Corrective Action Program component, because the site failed to perform an adequate engineering evaluation for a nonconforming condition [P.1(c)].

Inspection Report# : [2008007](#) (*pdf*)

Significance:  Mar 13, 2008

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to Adequately Correct Voiding Design Control Violation

The team identified a noncited violation of 10 CFR Part 50, Appendix B, Criterion XVI (Corrective Actions), because the licensee took inadequate corrective measures to address NRC identified deficiencies involving the calculation for voids in the residual heat removal and containment spray sump piping. The licensee's assessment failed to address the expected change in net-positive-suction-head required for the

pumps. NRC issued guidance informed the licensee that this term would need adjustment.

This finding was more than minor because, if left uncorrected, could become a more significant safety concern. For example, the net positive suction head calculations for residual heat removal pumps shows that the pumps have very little design margin. The failure to properly address the voids may lead engineers to believe that there is margin available for plant modifications (such as the containment sump modification), when there is not. Using the Manual Chapter 0609, "Significance Determination Process," Phase 1 Screening Worksheet, the issue screened as having very low safety significance because it was a qualification deficiency confirmed not to result in loss of operability in accordance with NRC Manual Chapter Part 9900, Technical Guidance, "Operability Determination Process for Operability and Functional Assessments." The finding had a crosscutting aspect in the Problem Identification and Resolution area, Corrective Action Program component, because the site failed to perform an adequate engineering evaluation for a performance deficiency [P.1(c)].

Inspection Report# : [2008007](#) (*pdf*)

G

Significance: Mar 13, 2008

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to Approve Engineering Calculations Prior to Use at Wolf Creek and Inadequate Work Instructions

The team identified a noncited violation of 10 CFR Part 50, Appendix B, Criterion III (Design Control), with two examples for: (1) the failure to implement engineering procedures and approve a third party calculation prior to use at Wolf Creek, and (2) the failure to properly translate licensing and design basis information into instructions. Following identification of the first example, the licensee approved the subject calculation for use at Wolf Creek. However, the calculation had an inadequate basis for the acceptance of a 5 percent void fraction in suction piping and a 20 percent void fraction in discharge piping. Specifically, the calculation failed to consider the impact of voids on natural circulation operations and was inconsistent with Technical Specifications, the Updated Final Safety Analysis Report, and net positive suction head calculations. All had assumed that Wolf Creek piping was water solid.

The finding was more than minor because, if left uncorrected, could result in a more significant safety concern. Specifically, the existence of 5 percent void fraction on the suction side of the pumps and 20 percent on the discharge side are still unanalyzed conditions and could adversely impact design basis accident analysis results. The licensee's operability assessment provided a reasonable expectation that design limits would not be exceeded. Using the Manual Chapter 0609, "Significance Determination Process," Phase 1 Screening Worksheet, the issue screened as having very low safety significance because it was a qualification deficiency confirmed not to result in loss-of-operability in accordance with NRC Manual Chapter Part 9900, Technical Guidance, "Operability Determination Process for Operability and Functional Assessments." The finding had a crosscutting aspect in the Problem Identification and Resolution area, Corrective Action Program component, because the site failed to perform an adequate engineering evaluation [P.1(c)].

Inspection Report# : [2008007](#) (*pdf*)

G

Significance: Mar 13, 2008

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to Implement Piping Design Procedure and ASME Code Requirements

The team identified a noncited violation of 10 CFR 50, Appendix B, Criterion V (Procedures), for the failure to implement piping design procedure requirements. The procedure required that piping systems be designed for normal component service (filling and venting) as well as routine operational surveillance (monthly emergency core cooling system venting). The piping systems were actually designed with some sections that could not be totally filled. The licensee also failed to design the piping in accordance with the ASME Code, which required vents at all piping high points.

The finding was more than minor because, if left uncorrected, it could result in a more significant safety concern. Specifically, the performance of emergency core cooling system systems with voids is not totally understood and could result in adverse systems response such as degraded pump performance or adversely impact natural circulation operations. Using the Manual Chapter 0609, "Significance Determination Process," Phase 1 Screening Worksheet, the issue screened as having very low safety significance because it was a qualification deficiency confirmed not to result in loss of operability in accordance with NRC Manual Chapter Part 9900, Technical Guidance, "Operability Determination Process for Operability and Functional Assessments."

Inspection Report# : [2008007](#) (*pdf*)

G

Significance: Mar 13, 2008

Identified By: NRC

Item Type: NCV NonCited Violation

Inadequate Root Cause Assessment

The team identified a noncited violation of 10 CFR Part 50, Appendix B, Criterion V, because the licensee failed to follow the site procedure when performing a root cause assessment for the emergency core cooling system voiding issues and, subsequently, completed an inadequate root cause assessment. The licensee came to the erroneous conclusion that operating experience evaluations were thorough, but actually drew

broad conclusions based on unverified and incorrect information, and had failed to identify significant contributors to the events.

The finding was more than minor because, if left uncorrected, it could result in a more significant safety concern. Specifically, the NRC relies heavily on the licensee's ability to find and correct their own safety issues. The licensee's reliance on unvalidated (and incorrect) information and the crafting of corrective measures to fit erroneous conclusions provides an unacceptable level of confidence that the licensee can consistently correct its own problems without NRC involvement. Using the Manual Chapter 0609, "Significance Determination Process," Phase 1 Screening Worksheet, the issue screened as having very low safety significance because it was a qualification deficiency confirmed not to result in loss-of-operability in accordance with NRC Manual Chapter Part 9900, Technical Guidance, "Operability Determination Process for Operability and Functional Assessments." The finding had a crosscutting aspect in the Problem Identification and Resolution area, Corrective Action Program component, because the site failed to perform an adequate engineering evaluation.[P.1(c)]

Inspection Report# : [2008007](#) (pdf)

Significance:  Feb 29, 2008

Identified By: NRC

Item Type: NCV NonCited Violation

Twenty one examples of failure to follow seismic requirements of scaffolding procedure

The team identified a noncited violation of 10 CFR 50 Appendix B Criterion V, in which 21 scaffolds in 10 plant areas that were in contact with or closer to plant equipment than procedure allowed. The procedure required engineering evaluations which did not contain any technical bases as to the acceptability of as built scaffolds. Subsequent engineering evaluation of each of the incorrect scaffolding installations confirmed that the configurations did not challenge operability. The NRC identified previous concerns with the erection of scaffolds, yet the licensee failed to take action to correct this issue.

The team evaluated the significance of this finding using Phase 1 of Inspection Manual Chapter 0609, Appendix A, "Significance Determination of Reactor Inspection Findings for At-Power Situations," and determined that the finding was of very low safety significance because the issue resulted in 21 unevaluated scaffolds which are likely not to challenge the ability of the plant to safely shutdown after an earthquake. As such, under Phase 1 screening, the deficiency is not related to a qualification or design deficiency, it did not represent a loss of safety function for a train or system as defined in the plant specific risk-informed inspection notebook, and did not screen as risk significant for seismic external events, because the affected systems were considered degraded, but operable. Using these inputs, the performance deficiency screened to Green. The team determined that the finding had a human performance crosscutting aspect in the area associated with decision making because the licensee failed to adopt a requirement to demonstrate that the proposed action is safe in order to proceed rather than a requirement to demonstrate that the proposed action is safe in order to disapprove the action. Specifically, Wolf Creek Generating Station did not conduct any review of engineering decisions to verify the validity of the underlying assumption that equipment and scaffolding could be in contact or closer than the established limit (H.1(b)).

Inspection Report# : [2008006](#) (pdf)

Significance:  Feb 29, 2008

Identified By: NRC

Item Type: FIN Finding

Failure to take Corrective Action For Missed Compensatory Measures

The team identified a finding because the licensee failed to take timely corrective actions to address a previously identified NRC finding. FIN 2007002-04 was issued because the licensee had failed to establish compensatory actions in response to the failure of all Main Annunciator Board alarms. Failure to have compensatory measures inhibited the licensee in their efforts to determine the cause of the alarm failures. Corrective actions repaired the equipment that caused of the annunciator failure, but were unrelated to the failure to follow procedures and take compensatory measures.

The team determined that this was a performance deficiency because the licensee had committed to take corrective actions in response to the previous NCV but failed to do so in a timely manner. The inspectors determined that this violation was greater than minor because it met the intent of MC 0612 Appendix E Example 4.a. in that there were several examples of the licensee failing to take corrective actions in response to NRC identified NCVs and findings, indicating that "The licensee routinely failed to perform engineering evaluations on similar issues." The inspectors performed a Phase I SDP evaluation and determined that the violation was screened as being very low safety significance, Green, because all of the answers to the Phase I Worksheet Mitigating Systems Column were "no". The team also determined that this finding has crosscutting aspects in the problem identification and resolution area associated with the corrective action program in that the licensee failed to implement timely or effective corrective actions. (P.1(d)).

Inspection Report# : [2008006](#) (pdf)

Significance:  Feb 29, 2008

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to take corrective action for missed operability evaluation compensatory measures

The team identified a violation of 10CFR50 Appendix B Criterion XVI because the licensee failed to take timely corrective actions to address

a previously identified NCV. NCV 2007003-05 was issued because the licensee had failed to perform an operability evaluation following bearing replacement on the Train B emergency exhaust system fan. Corrective actions were not related to the missed performance of the operability evaluation, but the equipment failure.

The team determined that this was a performance deficiency because the licensee had committed to take corrective actions in response to the previous NCV but failed to do so in a timely manner. The inspectors determined that this violation was greater than minor because it met the intent of MC 0612 Appendix E Example 4.a. in that there were several examples of the licensee failing to take corrective actions in response to NRC identified NCVs and findings, indicating that "The licensee routinely failed to perform engineering evaluations on similar issues." The inspectors performed a Phase I SDP evaluation and determined that the violation was screened as being very low safety significance, Green, because all of the answers to the Phase I Worksheet Mitigating Systems Column were "no". The team also determined that this finding has crosscutting aspects in the problem identification and resolution area associated with the corrective action program in that the licensee failed to implement timely or effective corrective actions. (P.1(d)).

Inspection Report# : [2008006](#) (pdf)

G

Significance: Feb 29, 2008

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to take timely corrective action to establish monitoring frequency of AFW pump governor null drift

The team identified a violation of 10 CFR 50 Appendix B Criterion XVI because the licensee failed to take timely corrective actions to address a previously identified finding. Finding 2006010 was issued because the licensee had failed to establish an acceptable monitoring frequency on their Turbine Driven Auxiliary Feedwater Pump speed governor null-drift as recommended by a Part 21 report from Engine Systems, Inc. The corrective actions to establish the monitoring for the null-drift were not implemented.

The team determined that this was a performance deficiency because the licensee had committed to take corrective actions in response to the previous NCV but failed to do so in a timely manner. The team determined that this violation was greater than minor because it met the intent of MC 0612 Appendix E Example 4.a. in that there were several examples of the licensee failing to take corrective actions in response to NRC identified NCVs and findings, indicating that "The licensee routinely failed to perform engineering evaluations on similar issues." The team performed a Phase I SDP evaluation and determined that the violation was screened as being very low safety significance, Green, because all of the answers to the Phase I Worksheet Mitigating Systems Column were "no." The team also determined that this finding has crosscutting aspects in the problem identification and resolution area associated with the corrective action program in that the licensee failed to implement timely or effective corrective actions (P.1(d)).

Inspection Report# : [2008006](#) (pdf)

G

Significance: Feb 29, 2008

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to take timely corrective action to correct Barton transmitter defects

The team identified a noncited violation of 10 CFR Part 50, Appendix B, Criterion XVI, regarding the failure to identify and correct conditions adverse quality associated with NRC NCV 2006-004-02 documented in Inspection Report 2006-004. Specifically, the licensee did not address in the apparent cause evaluation and corrective actions the failure to follow procedures resulting in an inadequate inspection of installed Barton pressure transmitters for known potential manufacturing defects which resulted in a previous violation of Administrative Procedure AP 28-011, "Resolving Deficiencies Impacting SSC's," Revision 1. The licensee inappropriately credited transmitter inspections that occurred several years prior to receipt of the vendor recommendation as sufficient to resolve this issue.

This finding was more than minor because it could reasonably be viewed a precursor to a significant event and 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 an actual 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 problem identification and resolution area associated with the corrective action program in that the licensee failed to identify the issue completely and thoroughly evaluate the problem such that the problem was resolved (P.1(a), P.1(c)).

Inspection Report# : [2008006](#) (pdf)

G

Significance: Feb 29, 2008

Identified By: NRC

Item Type: FIN Finding

Failure to take timely corrective action to correct annunciator feed configuration deficiencies.

The team identified a green finding for failure to implement corrective action for abandoned in place annunciator feed wiring deficiencies. CR 2005-003275 was initiated because Cables ST-009 and ST-019 were field-spliced together to prevent electrical shocks such that the system configuration did not match the system drawing. Work Order (WO) 07-292004-000 was initiated to correct this condition but was closed as

unworkable. CR 2005-003275 was closed to this closed work order even though the condition was not corrected, leaving the system in a condition not reflected in drawings or design documents. This configuration could result in further shocks, and further configuration control issues. The main annunciator system and its feeds are not safety--related, and therefore this performance deficiency is not a violation of NRC requirements.

The failure to implement corrective actions for an identified configuration control issue is a performance deficiency. This item affects the mitigating systems cornerstone. The team determined that this violation was greater than minor because it met the intent of MC 0612 Appendix E Example 4.a. in that there were several examples of the licensee failing to take corrective actions in response to findings, indicating that "The licensee routinely failed to perform engineering evaluations on similar issues." The team performed a Phase I SDP evaluation and determined that the violation was screened as being very low safety significance, Green, because all of the answers to the Phase I Worksheet Mitigating Systems Column were "no." The team also determined that this finding has crosscutting aspects in the problem identification and resolution area associated with the corrective action program in that the licensee failed to implement timely or effective corrective actions. (P.1(d)).

Inspection Report# : [2008006](#) (pdf)

Significance:  Dec 31, 2007

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to evaluate ESW valve corrosion

The inspectors identified a noncited violation (NCV) of 10 CFR Appendix B, Criterion V, "Instructions, Procedures, and Drawings," for failure to follow a procedure which required an evaluation of the Train B of ESW traveling screen wash valve and identical valves in the system after the Train A ESW screen wash valve had failed. Wolf Creek declined to enter its operability process but did tag Valve EF HV-92 open on September 13, 2007. An operability evaluation was produced on September 27, after EF HV-92 was disassembled and found to have unacceptable disc material loss due to corrosion. Corrective actions from the September 27 evaluation include a disassembly of an identical valve in the essential service water system that shows degrading but operable performance.

The failure to follow Procedure AP 26C-004, "Technical Specification Operability," which required an evaluation of Valve EF HV-92, is a performance deficiency. The finding is more than minor because if left uncorrected the valve discs corrosion would become a more significant safety concern. The finding was of very low safety significance because the issue resulted in Valve EF HV 92 being degraded, but did open even with significant material and is not related to a qualification or design deficiency, did not result in the loss of safety function for greater than 24 hours, and was not related to external events such as fires and floods. The cause of the finding had problem identification and resolution crosscutting aspects in the area associated with the corrective action program because the licensee failed to evaluate the failure mechanism completely, accurately, and in a timely manner commensurate with its safety significance (P.1(a)).

Inspection Report# : [2007005](#) (pdf)

Significance:  Dec 31, 2007

Identified By: NRC

Item Type: NCV NonCited Violation

Inadequate evaluation of EDG for common cause failure

The inspectors identified a noncited violation of Technical Specification 3.8.1 for failure to perform an adequate common cause evaluation within 24 hours to demonstrate no common cause failure mechanism existed between the emergency diesel generators. Wolf Creek's common cause evaluation stated that the "Hypothesis" was that the EDG A digital reference unit (DRU) had not been refurbished as recommended in a April 21, 2004, 10 CFR Part 21 notification from Fairbanks Morse which stated that Wolf Creek's DRUs were affected by an integrated circuit contamination problem. Inspectors reviewed the April 21 notification and found that the slow start rpm ramp function was affected, however, The inspectors reviewed operating experience and other generic correspondence and found a 10 CFR Part 21 notification dated January 23, 2006, from Engine Systems, Inc. (ESI), who is a vendor for DRUs. The ESI notification describes a DRU deficiency in which an integrated circuit manufacturing defect can cause failure of the engine load raise and lower signals to the electronic governor controller. The inspectors noted this failure mechanism was similar to Wolf Creeks observed failure on November 1, 2007. Both EDGs were found to be affected by the ESI notification.

The inspectors determined that the failure to demonstrate, per TS 3.8.1 required actions B.3.1 or B.3.2, that no common cause failure existed for the EDGs is a performance deficiency. The finding is more than minor because it is associated with the equipment performance attribute for the Mitigating Systems Cornerstone; and, it affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). The finding was of very low safety significance because the issue resulted in the EDG being degraded, but likely to start even with an intermittent failure and did not result in the loss of safety function for greater than 24 hours, and was not related to external events such as fires and floods. The cause of the finding had problem identification and resolution crosscutting aspects in the area associated with the corrective action program because the licensee failed to evaluate the failure mechanism completely, accurately, and in a timely manner commensurate with its safety significance (P.1(a)).

Inspection Report# : [2007005](#) (pdf)

Significance:  Dec 31, 2007

Identified By: NRC

Item Type: FIN Finding

Failure to enter and evaluate EDG operating experience in CAP

The inspectors identified a finding for failure to enter into corrective action program evaluate relevant emergency diesel generator operating experience which allowed a manufacturing defect to exist resulting in a testing failure. Procedure AP 20E-001, Step 4.1.1, in part, directs the screening and review of operating experience from sources such as vendors, the NRC, and other utilities. Although, the inspectors found that Wolf Creek was not specifically listed as affected in the ESI Part 21, they had procured DRUs that were listed by serial number on the ESI notification. The inspectors also found a Woodward service bulletin dated January 2006 that Wolf Creek had not reviewed addressing the same issue that listed DRU serial numbers affected which included Wolf Creeks DRUs.

The failure to enter into corrective action program evaluate publicly available operating experience directly applicable to Wolf Creek's emergency diesel generators is a performance deficiency. This finding was more than minor because it is associated with the equipment performance attribute for the Mitigating Systems Cornerstone; and, it affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). The finding is of very low safety significance because the issue resulted in the EDG being degraded, but likely to start even with an intermittent failure and is not related to a qualification or design deficiency, did not result in the loss of safety function for greater than 24 hours, and was not related to external events such as fires and floods. The cause of the finding has a problem identification and resolution crosscutting aspect in the area associated with the operating experience program because the licensee's operating experience process did not use operating experience information, including vendor recommendations, to support plant safety. Specifically, the licensee did not systematically collect, evaluate, and communicate relevant external operating experience to affected internal stakeholders in a timely manner (P.2(a)).

Inspection Report# : [2007005](#) (*pdf*)

G

Significance: Dec 31, 2007

Identified By: NRC

Item Type: FIN Finding

Clogged drains cause circulating water roof loads to exceed design

The inspectors identified a Green finding for exceeding the calculated roof loading for the circulating water screen house. In May 2007, Wolf Creek received heavy rains and water leaks from the circulating water screen house roof were observed. On May 8, 2007, it was observed that the roof of the circulating water screen house had accumulated approximately eight inches of standing water and that the drains were blocked by debris. Subsequently on May 8, the drains were cleared and the roof was drained. A roof yield or collapse was assumed to result in the loss of both circulating water and normal service water.

Exceeding the calculated allowable roof loading due to clogged drains is a performance deficiency. The finding is more than minor because it is associated with the equipment performance attribute for the Mitigating Systems Cornerstone; and, it affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences.

Additionally, this finding was more than minor because it is associated with the equipment performance attribute for the Initiating Events Cornerstone; and, it affected the 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. This finding screened to a Phase 3 analysis because two or more cornerstones (Initiating Events and Mitigating Systems) were affected. The Senior Reactor Analyst performed the Phase 3 analysis and determined it to be of very low safety significance.

Inspection Report# : [2007005](#) (*pdf*)

G

Significance: Oct 06, 2007

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to implement transient combustible material control permit requirements

The inspectors identified a Green noncited violation of Technical Specification 5.4.1.d for failing to control combustible materials in an area of the plant that contained safety-related equipment. During a walkdown, inspectors noted that temporary scaffolding constructed of flame retardant treated wood installed in the emergency diesel generator rooms did not have a transient combustible materials permit. Following review of the procedure for control of combustibles, it was noted that the licensee inappropriately considered fire retardant treated wood as noncombustible material and exempted it from permit control. This could lead to the uncontrolled use of fire treated wood throughout the facility, even in excess of fire hazard analysis limits for fire loads.

The inspectors determined that the inadequate control of transient combustibles in the emergency diesel generator rooms was more than minor because, if left uncorrected, it would become a more significant safety concern and could potentially affect emergency diesel generator availability due to fire under the mitigating systems cornerstone. The finding was of very low safety significance because it involved the combustible controls program and was assigned a low degradation rating since the flame retardant treated wood is considered a high flashpoint material.

Inspection Report# : [2007004](#) (*pdf*)

G

Significance: Oct 06, 2007

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to collor EDG assembly procedure resulting in NOED

A self-revealing noncited violation was identified regarding failure to follow a procedure used to reassemble the intercooler and jacketwater pumps to the Train A emergency diesel generator resulting in the Emergency Diesel Generator A being inoperable. During reassembly of the Emergency Diesel Generator A on June 6, 2007, the stationary seals for the intercooler and jacketwater pumps were not correctly installed in their housings. On July 5, 2007, the Emergency Diesel Generator A failed its surveillance test because the intercooler pump leaked at a rate of 23.4 ml/min with an acceptability limit of 9.1 ml/min. Even with the leakage, Emergency Diesel Generator A was later determined to be capable of running for greater than 24 hours.

The failure to install the stationary seals in accordance with the approved work orders is a performance deficiency. The finding is more than minor because it is associated with the human performance attribute of the mitigating systems cornerstone; and, it affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). The finding is of very low safety significance because the issue does not represent a qualification or design deficiency, it did not represent a loss of safety function for a train or system as defined in the plant specific risk-informed inspection notebook, and was not related to external events such as fires and floods. The inspectors also determined that the finding has a human performance crosscutting aspect in the area associated with resources because the licensee failed to ensure that mechanics had adequate emergency diesel generator training to assure correct reassembly of the diesel auxiliaries as stated in Wolf Creek's root cause evaluation [H.2(b)].

Inspection Report# : [2007004](#) (*pdf*)

Significance:  Oct 06, 2007

Identified By: NRC

Item Type: FIN Finding

Failure to use appropriate guidance for valve operation

A self-revealing finding was identified when a nonlicensed plant operator failed to utilize appropriate guidance and used excessive torque on service water Valves 1WS0002A and 1WS0004 resulting in damage to the valves and unavailability of service water Pump 1WS01PA and the low-flow service water Pump 1WS002P. Valve 1WS0002A was repaired as emergent work and returned to service after approximately 42 hours of being unavailable and Valve 1WS0004 was repaired as corrective maintenance and returned to service after approximately 65 days of unavailability. This issue is captured in the licensee's corrective action program.

The finding was more than minor because it is associated with the equipment performance attribute for the mitigating systems cornerstone; and, it affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The inspectors also determined that this finding was more than minor because it is associated with the equipment performance attribute for the initiating events cornerstone, and it affected the 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. A Phase 3 evaluation was necessary since the finding involved concurrent multiple equipment degradations from a common cause. The Phase 3 evaluation concluded that the finding was of very low safety significance (Green). The inspectors also determined that the finding had a human performance crosscutting aspect in the area of work practices because the licensee failed to effectively communicate expectations regarding valve operations in accordance with procedural requirements [H.4(b)].

Inspection Report# : [2007004](#) (*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*)

Barrier Integrity

G

Significance: Jun 28, 2008

Identified By: NRC

Item Type: NCV NonCited Violation

Troubleshooting activities bypass design control for the fuel transfer system

The inspectors identified a violation of TS 5.4.1.a in which Wolf Creek raised the winch load setpoint for its fuel transfer system to avoid trips without knowing the cause. During core reload, Wolf Creek experienced repeated trips of the fuel handling system winch. It was not until after NRC involvement that it was identified that the winch load setpoints were inappropriately altered. The inspectors found that on April 17, 2008, under Work Order 08 305599-000, the load setpoints and slow speed zones were inappropriately changed from 250 pounds for 1 second and 590 inches, to 300 pounds for 2 seconds and 585 inches, respectively. The inspectors found that under M 716 00787, Section G, "Software Change Log," no changes to the winch load limits or slow speed zones were referenced. The fuel transfer system is also explicitly controlled under Procedure AP 05-005, "Design, Implementation, & Configuration Control of Modifications." It was subsequently discovered that the setpoints were controlled by a vendor technical document that Wolf Creek accepted as the fuel transfer cart design. Inspectors were unable to locate, and Wolf Creek was unable to produce, modification documentation that justified these software changes. After the discovery that the setpoints were inappropriately changed, the 250 pounds for 1 second and 590 inches were loaded into the EEPROM (nonvolatile memory for the PLC). Power to the fuel transfer system was cycled and the speed change for the cart was observed at 590 inches. On this basis, Wolf Creek believed that the settings had been correctly re-established, and fuel moves continued. Wolf Creek has had difficulty determining with certainty that the original setpoints were correctly re-established.

The finding was more than minor because it is associated with the human performance attribute for the barrier integrity cornerstone; and, it affected the cornerstone objective to provide reasonable assurance that physical design barriers (fuel cladding) protect the public from radio nuclide releases caused by accidents or events. Specifically, this issue relates to the procedure adherence example of the human performance attribute because the design process was bypassed to mask fuel cart problems. The finding was of very low safety significance because the issue did not result in fuel handling errors that caused damage to fuel clad integrity or a dropped fuel assembly. The cause of the finding has human performance crosscutting aspects in the area associated with decision making. Specifically, Wolf Creek did not ensure safety by making safety or risk significant decisions by using any procedural or systematic process when faced with the unexpected and repeated fuel transfer cart winch trips.

Inspection Report# : [2008003](#) (*pdf*)

Emergency Preparedness

Occupational Radiation Safety

G

Significance: Apr 07, 2008

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to control area as a locked high radiation area

- The inspector reviewed a self-revealing noncited violation of Technical Specification 5.7.2.a for failure to evaluate changing radiological conditions and control an area as a locked high radiation area. Specifically, on October 17, 2007, dose rates in Room 7604 increased to levels requiring posting as a "Locked High Radiation Area" as a result of a vent and drain evolution. Dose rates reached a level of 1500 mRem/hour prior to the area being properly posted and controlled. This issue was entered into the licensee's corrective action program as Condition Report 2007-003934. Immediate corrective actions included posting and controlling the area as a locked high radiation area. Other corrective actions included changing the vent and drain process to change the vent path.

This finding is greater than minor because it is associated with the occupational radiation safety program and process attribute and affected the cornerstone objective, in that, the failure to properly post and control access to a locked high radiation area has the potential to increase personnel dose. This occurrence involves the potential for unplanned, unintended dose. Utilizing Inspection Manual Chapter 0609, Appendix C, "Occupational Radiation Safety Significance Determination Process," the inspector determined that the finding was of very low safety significance because it did not involve; (1) as low as is reasonably achievable planning and controls, (2) an overexposure, (3) a substantial potential for overexposure, or (4) an impaired ability to assess dose. This finding has a crosscutting aspect in the area of work control, work planning, in that the licensee failed to appropriately plan work activities by incorporating job site conditions that may impact radiological safety [H.3(a)].

Inspection Report# : [2008002](#) (*pdf*)

G

Significance: Apr 07, 2008

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to follow procedure

• The inspector reviewed a self-revealing noncited violation of Technical Specification 5.4.1 for failure to follow a licensee procedure. Specifically, on March 29, 2008, one of two radiographers conducting radiography operations in the quality control vault received a dose rate alarm on their electronic dosimeter. The two radiographers evaluated the dose received and decided to continue with radiography without notifying health physics personnel to evaluate the conditions. This issue was entered into the licensee's corrective action program as Condition Report 2008-001181. Immediate corrective actions included restriction of the radiographers to log onto the radiation work permit and discussions with the radiographers and the contractor's radiation safety officer. Long term corrective action is still being evaluated. This finding is greater than minor because it is associated with the occupational radiation safety program and process attribute and affected the cornerstone objective, in that, the failure to stop work and notify health physics personnel for assistance had the potential to increase personnel dose. This occurrence involves the potential for unplanned, unintended dose. Utilizing Inspection Manual Chapter 0609, Appendix C, "Occupational Radiation Safety Significance Determination Process," the inspector determined that the finding was of very low safety significance because it did not involve: (1) as low as is reasonably achievable planning and controls, (2) an overexposure, (3) a substantial potential for overexposure, or (4) an impaired ability to assess dose. This finding has a crosscutting aspect in the area of decision making, risk significant decisions, because the radiographer and assistant failed to contact health physics personnel to discuss the circumstances surrounding the unexpected dose rate alarm [H.1(a)].

Inspection Report# : [2008002](#) (*pdf*)

Public Radiation Safety



Significance: G Sep 12, 2008

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

Failure to Provide an Accurate Shipping Manifest

The team reviewed a self-revealing, noncited violation of 10 CFR 20.2006(b) resulting from the licensee's failure to provide an accurate shipping manifest. On May 16, 2008, the licensee shipped used radioactive resin to a waste processor. The shipment contained 65 cubic feet of resin and a total activity of 177 Curies. However, the manifest papers accompanying the shipment only indicated 35 cubic feet of resin and a total activity of 83.8 Curies. The licensee was notified of the problem by the shipment recipient. The licensee's corrective actions were to fax a corrected shipment manifest to the processor, suspend resin shipments, and conduct an apparent cause investigation. The problem involving the incorrect manifest was documented in the corrective action program as Condition Report 2008-2357.

The finding is greater than minor because it was associated with the Public Radiation Safety cornerstone attribute, transportation program, and affected the cornerstone objective in that it provided incorrect information as part of hazard communication which could increase public dose. Using the public radiation safety significance determination process, the team determined the finding had very low safety significance because (1) radiation limits were not exceeded; (2) there was no breach of a package during transit; (3) it did not involve a certificate of compliance issue; (4) it was not a low level burial ground nonconformance; and (5) it did not involve a failure to make notifications or provide emergency information. Additionally, this finding had a crosscutting aspect in the area of human performance, resources component, in that, the licensee did not establish adequate procedures and documentation necessary to ensure that information entered on the manifest was correct before shipping the package.

Inspection Report# : [2008009](#) (*pdf*)

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 : November 26, 2008