D.C. Cook 2 – Quarterly Plant Inspection Findings

3Q/2017 – Plant Inspection Findings

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Initiating Events

Significance: G Dec 31, 2016
Identified By: Self-Revealing
Item Type: FIN Finding
Moisture Separator Reheater Rupture
.A self revealed finding of very low safety significance (Green), occurred on July 6, 2016, when a portion of the Unit 2 Right Moisture Separator Reheater (MSR) 'B' bellows assembly ruptured, causing a steam leak which damaged the adjacent turbine building wall. There were no associated violations of regulatory requirements since the piping was non safety related. Reacting to the rupture, operators tripped the reactor and isolated the leak by shutting the Main Steam Isolation Valves. While addressing a number of issues with the MSR's that occurred following a re design of the internals in 2010, the licensee changed the design of the rods that hold the bellows assembly on each MSR pipe together. The design change called for tack welds to only be used on the end nuts of the rod. Contrary to the design change (EC-51875), tack welds were placed on other nuts as well. The tack welds were determined to have changed the material properties of the rod in the vicinity of the welds, which caused cracking to initiate during operation. Eventually, the cracks grew to a point where two rods completely severed, causing the bellows to tear and rupture. Following the safe shutdown, the licensee repaired the bellows, inspected other rods, and restarted the plant. The issue was entered into their Corrective Action Program (CAP) as Action Request (AR)-2016-7865.

The issue was more than minor because it adversely affected the Design Control Attribute of the Initiating Events cornerstone because it resulted in a reactor trip and Unusual Event. Per the Significance Determination Process, a detailed risk evaluation was required because during the rupture operators had to close the Main Steam Isolation Valves, which isolated the main condenser (the preferred post trip decay heat removal path). An NRC Regional Senior Reactor Analyst performed the evaluation and concluded the finding was of very low risk significance (Green). The inspectors determined the finding had an associated cross cutting aspect in the Human Performance Area, specifically, H.12, Avoid Complacency. Specifically, site personnel did not plan for the possibility of mistakes, latent issues, and inherent risk, even while expecting successful outcomes.

Inspection Report# : 2016004 *(pdf)*

Mitigating Systems

Significance: G Jun 30, 2017
Identified By: NRC
Item Type: NCV Non-Cited Violation
Failure to Ensure the Unit 2 CCW HX Monitoring Program Could Demonstrate Its Continued Operability Between Maintenance Intervals
The inspectors identified a finding of very low safety significance (Green) and associated NCV of Title 10 of the Code of Federal Regulations, (CFR) Part 50, Appendix B, Criterion XI, "Test Control," for the licensee's failure to establish a heat exchanger monitoring program for the Unit 2 east component cooling water (CCW) heat exchanger that demonstrated it would perform satisfactorily in service and remain operable within its required range of physical conditions for the entire interval between heat exchanger maintenance inspections and cleanings. The licensee entered this finding into their Corrective Action Program (CAP) and, after a review of the Ultimate Heat Sink temperatures, determined the Unit 2 East CCW heat exchanger remained operable because the Ultimate Heat Sink temperatures had remained below the point where operability of the heat exchanger could be challenged.

The performance deficiency was determined to be more than minor because it was associated with the Mitigating Systems cornerstone attribute of Equipment Performance and it adversely affected the associated cornerstone objective to ensure the availability, reliability, and capability of the CCW system to respond to initiating events to prevent undesirable consequences. Specifically, the monitoring program established for the Unit 2 East CCW heat exchanger did not ensure its availability, reliability, and capability for the entire interval between heat exchanger maintenance inspections and cleanings. The finding screened as of very low safety significance (Green) because although it affected the design or qualification of the Unit 2 East CCW heat exchanger, it did not result in the loss of operability or functionality of the heat exchanger. The inspectors determined this finding had an associated cross cutting aspect, Design Margins, in the Human Performance cross cutting area [H.6] because the licensee did not ensure the Unit 2 East CCW heat exchanger's heat transfer margin was carefully guarded after discovering excessive tube plugging above the acceptance criteria in 2016. Specifically, special attention was not placed on maintaining the safety related heat exchanger to ensure it would remain capable of performing its specified safety function within the required range of physical conditions during the entire interval between heat exchanger maintenance inspections and cleanings.

Inspection Report# : 2017002 *(pdf)*

Significance: G Jun 30, 2017
Identified By: Self-Revealing
Item Type: NCV Non-Cited Violation
Unit 2 Containment Equalization Fan Failed Surveillance
A finding of very low safety significance was self revealed on March 23, 2017, when one of the Unit 2 Containment Equalization (CEQ) Fans, 2-HV-CEQ-1, failed its surveillance. Technical Specification (TS) 5.4.1, "Procedures," requires that the applicable procedures covered in Regulatory Guide 1.33 are established, implemented, and maintained. Regulatory Guide 1.33 requires that maintenance that can affect the performance of safety related equipment should be properly preplanned and performed in accordance with documented instructions appropriate to the circumstances. Contrary to these requirements, a preventative maintenance activity to grease the backdraft damper bearings of the CEQ fan resulted in the fan being left inoperable until the next scheduled surveillance approximately a month later. Due to inadequate work instructions, the damper was not cycled enough times following greasing, which resulted in a condition where more force than allowed by the Technical Specifications was required to open the

damper. Due to an inadequate post maintenance test, this was not detected until the next surveillance was performed. Upon failure of the surveillance, technicians re greased the bearings, cycled the damper, and tested it satisfactorily. Although qualified, the technicians who first performed the maintenance were unaware of certain nuances associated with the CEQ fan dampers. This information was not described in the work instructions and the post maintenance test did not validate the opening force. The issue was entered into the CAP and an apparent cause evaluation was performed by the licensee.

The issue was greater than minor because it adversely affected the Procedure Quality attribute of the Mitigating Systems cornerstone. Specifically, the inadequate maintenance procedures adversely affected the availability, reliability, and capability of a system that responds to initiating events to prevent undesirable consequences (i.e., core damage). The finding screened to Green, or very low safety significance, based on IMC 0609 Appendix H, "Containment Integrity Significance Determination Process," because CEQ fans are not important contributors to Large Early Release Frequency and Hydrogen Igniters remained available. The inspectors determined there was a cross cutting aspect associated with the finding, namely, H.5., "Work Management." Specifically, the licensee did not identify and manage risk nor coordinate between different work groups when it was recognized the normal maintenance group would not be working on the CEQ Fan. Further, the apparent cause evaluation identified a need to better coordinate the preventative maintenance activities with the surveillance tests.
Inspection Report# : 2017002 *(pdf)*

Significance: G Jun 30, 2017
Identified By: Self-Revealing
Item Type: NCV Non-Cited Violation
Failure to Identify Parts Subject to a Part 21
A self revealed finding and associated violation occurred on April 2, 2012, when the licensee failed to prevent installation of relays identified in a Part 21. Although the performance deficiency occurred in 2012, the consequence of the error did not manifest until March 2017, when a defective relay caused the Unit 2 control room indicating and display (CRID) 3 inverter to transfer and remain on the alternate power supply. Title 10 CFR 50 Appendix B, Criterion XV requires, in part, that "Measures shall be established to control materials, parts, or components which do not conform to requirements in order to prevent their installation." Contrary to this requirement, on April 22, 2012, the licensee failed to prevent installation of an AMETEK board, PC201 with a defective relay. This led to a failure of the CRID 3 inverter on March 27, 2012. The licensee replaced the circuit board and restored CRID 3 to an operable status.

The inspectors determined that the failure to prevent installation of defective parts into the safety related CRID system was a performance deficiency that warranted a significance determination. Using Attachment 0609.04, "Initial Characterization of Findings," dated October 7, 2016, Table 2, the inspectors determined that the finding affected the Mitigating Systems cornerstone. As a result, the inspectors evaluated the finding using IMC 0609, Attachment 1 Exhibit 2, dated June 19, 2012. The inspectors answered "no" to all the questions, therefore the finding screened as Green. Using Attachment 0609.04, "Initial Characterization of Findings," dated October 7, 2016, Table 2, the inspectors determined that the finding affected the Mitigating Systems cornerstone. The inspectors did not identify a cross cutting aspect associated with this finding because it was not reflective of current performance.

Inspection Report# : 2017002 *(pdf)*

Significance: G Jun 30, 2017
Identified By: NRC
Item Type: NCV Non-Cited Violation
Inadequate Design Control Measures to Ensure Leakage Remained Within Analysis
The inspectors identified a finding of very low safety significance (Green) and an associated NCV of 10 CFR Part 50,

Appendix B, Criterion III, "Design Control," for the failure to have adequate design control measures verify that the Essential Service Water to Containment Spray (CTS) heat exchanger outlet valves were not leaking in excess of the limits of the Large Break Loss of Coolant Accident (LBLOCA) analysis. This finding was entered into the licensee's CAP to evaluate adequate design control measures.

The performance deficiency was determined to be more than minor because the finding was associated with the Mitigating Systems cornerstone attribute of design control and affected the cornerstone objective of ensuring the capability of the CTS system to respond to an initiating event to prevent undesirable consequences. The finding screened as of very low safety significance (Green) because it did not result in the loss of operability or functionality of one of the trains of the CTS system. The inspectors did not identify a cross cutting aspect associated with this finding because it was not reflective of current performance.

Inspection Report# : 2017002 *(pdf)*

Significance:  Mar 31, 2017
Identified By: Self-Revealing
Item Type: NCV Non-Cited Violation
Improper Disconnect Operation
A self revealed finding and associated Non-Cited Violation (NCV) occurred on January 10, 2017, when the licensee caused a loss of a qualified off site circuit while opening a disconnect on the Unit 2 reserve feed transformer. Regulatory Guide 1.33 requires procedures for operating the onsite and offsite electrical distribution system; however the licensee did not develop a procedure or instruction for operating the electrical distribution system. Licensee personnel opened a disconnect to the Unit 2 reserve auxiliary transformer with the transformer energized but unloaded. This action resulted in trip of an upstream breaker and unplanned Technical Specification entry for the opposite unit. The licensee recovered the offsite circuit for Unit 1. The licensee entered the issue into the corrective action program (CAP) as Action Request (AR) 2017-0346.

The inspectors determined that the failure to develop, implement, and maintain procedures or work instructions for the electrical distribution system was a performance deficiency. The performance deficiency impacted the mitigating system performance objective of ensuring the availability of systems that respond to initiating events. The finding was not greater than green in accordance with IMC 0609, Appendix A, Exhibit 2, dated June 19, 2012, because the answer to all four questions was no. The finding does not include a cross cutting aspect because the licensee followed guidance for operating the disconnect that existed for the life of the plant and is therefore not reflective of current performance.
Inspection Report# : 2017001 *(pdf)*

Significance:  Mar 31, 2017
Identified By: Self-Revealing
Item Type: NCV Non-Cited Violation
Failure to Control Nonconformaing Delivery Valve Holders on Emergency Diesel Generators
A self revealed finding of very low safety significance with an associated NCV of Title 10 of the Code of Federal Regulations (CFR) Part 50, Appendix B, Criterion XV, "Nonconforming Materials, Parts, or Components," occurred when the delivery valve holder (DVH) on a fuel injection pump failed during a run of the 1AB emergency diesel generator (EDG). Each cylinder on an EDG has a fuel injection pump. The DVH is the part of the fuel injection pump where the high pressure fuel line meets the pump discharge. A thru wall crack developed from a machined portion inside the DVH that had too sharp of a corner. This same phenomenon occurred onsite and caused a leak in 2013 as well. In 2013, the licensee identified the tight radius as an issue and also identified a particular manufacturing lot of DVHs that might have the tight radius. Contrary to their commercial grade dedication (CGD) procedures, the licensee did not update their CGD plan for these parts to include the radius as a critical characteristic. Further, the licensee relied

on informal communications from the commercial grade supplier of the parts to conclude only a certain subset of the suspected lot of DVHs were susceptible to cracking. Finally, several management approved actions to remove all affected DVHs of the lot were not performed, as there was the belief by some that only certain DVHs were affected. As a result, the licensee installed many DVHs from the suspect lot they thought were acceptable. However, in December 2016, one of the DVHs thought to be acceptable developed a leak during an EDG run. The radius was discovered to be out of tolerance, as were numerous other radii in DVHs across all of the EDGs which were from the suspect manufacturing lot. The licensee declared three of the four onsite EDGs inoperable, replaced DVHs, and commenced a root cause evaluation to address the issue.

The issue was more than minor because it adversely affected the Design Control attribute of the Mitigating Systems cornerstone. Specifically, allowing nonconforming parts to be installed on safety related equipment without proper controls or evaluation adversely affects the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The finding screened as Green because performance testing of representative DVHs and engine analysis demonstrated that the EDGs in the as found condition would have been able to perform their safety functions for the required lengths of time. The inspectors determined the issue had a cross cutting aspect in the Problem Identification and Resolution area, specifically, P.2, "Evaluation." Despite identifying a defect on a safety related part due to a failure in 2013, the licensee failed to properly evaluate the condition and ensure all susceptible parts were accounted for. Specifically, the failure to follow station processes for corrective action and CGD resulted in a defective part causing a leak on an EDG.
Inspection Report# : 2017001 *(pdf)*

Barrier Integrity

Significance: G Jul 28, 2017
Identified By: NRC
Item Type: NCV Non-Cited Violation
Failure to Correct Operable, but Non-Conforming Conditions
The inspectors identified a finding of very low safety significance and an associated non-cited violation of 10 Code of Federal Regulations (CFR) Part 50, Criterion V for three examples where the licensee failed to follow procedures associated with the licensee's quality assurance program. This issue resulted in the licensee not properly classifying some structures, systems and components (SSCs) as operable, but non-conforming, consistent with station procedures.

The inspectors determined that the failure to properly classify the above SSCs as operable, but non-conforming, was within the licensee's ability to foresee and correct and was, therefore, a performance deficiency. This performance deficiency was considered more than minor, because it adversely affected the Design Control attribute of Reactor Safety□Barrier Integrity, ensuring that SSCs would remain functional during a design basis event. Specifically, station procedures required that prompt action be taken to address operable, but non-conforming conditions. The inspectors evaluated the finding using the Significance Determination Process in accordance with IMC 0609, Appendix A, "The Significance Determination Process for Findings At-Power," Exhibit 3, dated June 19, 2012. The finding was of very low safety significance (Green), because there was no actual loss of safety function for the affected SSCs.

The inspectors determined this finding affected the cross-cutting area of problem identification and resolution in the aspect of resolution, specifically to ensure that the organization takes effective corrective actions to address issues in a timely manner commensurate with their safety significance.

Inspection Report# : 2017007 *(pdf)*

Significance: G Dec 31, 2016
Identified By: NRC
Item Type: NCV Non-Cited Violation
Designated Individual Not at Airlock
The inspectors identified a finding and associated NCV of Technical Specification (TS) 5.4.1 for failing to station a designated individual at the airlocks. Licensee procedure 2-OHP-4030-227-041, Revision 34 required that a designated person be available at the airlock at all times during fuel handling if both air lock doors are open. TS 5.4.1, Procedures, requires, in part, that the applicable procedures recommended in Regulatory Guide 1.33, Revision 2, Appendix A, February 1978, be established, implemented, and maintained. Regulatory Guide 1.33 states, in part, that general plant operating procedures for refueling and core alterations should be covered by written procedures. Contrary to this requirement, on October 18, 2016, the licensee failed to implement procedure 2-OHP-4030-227-041, "Refueling Integrity." In response to the inspectors concern, the licensee stationed the designated individual. The licensee entered the issue into their CAP as AR-2106-11898.

The issue screened as more than minor because it adversely affected the Human performance attribute of the barrier integrity cornerstone. The inspectors concluded the issue was of very low safety significance using Inspection Manual Chapter 0609 Appendix G, Attachment 1 dated May 9, 2014, because the issue did not increase Core Damage Frequency or Large Early Release Frequency. The finding included a cross cutting aspect of H.9, training, because operations staff had an incorrect understanding of the procedural requirements.
Inspection Report# : 2016004 *(pdf)*

Emergency Preparedness
Occupational Radiation Safety

Significance: G Mar 31, 2017
Identified By: Self-Revealing
Item Type: NCV Non-Cited Violation
Failure to Brief Worker Entry to High Radiation Area Resulting in the Unplanned Dose Rate Alarm
A finding of very low safety significance and an associated Non-Cited Violation of Technical Specification 5.7.1.b was self revealed for the failure to a make radiation worker aware of the radiation dose rate before entering a high radiation area. The failure to brief the worker resulted in an unplanned electronic dosimeter dose rate alarm. The worker immediately exited the area and reported the event to the radiation protection staff. The licensee entered the event into their Corrective Action Program as Action Request 2016-13827.

The inspectors determined that the performance deficiency was more than minor in accordance with Inspection Manual Chapter (IMC) 0612, Appendix B, because the finding impacted the program and process attribute of the Occupational Radiation Safety Cornerstone and adversely affected the cornerstone objective of ensuring adequate protection of worker health and safety from exposure to radiation. Specifically, worker entry into a high radiation area without an adequate briefing could lead to unintended dose. The inspectors also identified an example in IMC 0612, Appendix E, which is similar to the performance issue. Therefore, the finding was determined to be of very low safety significance in accordance with IMC 0609, Appendix C, "Occupational Radiation Safety Significance Determination Process," dated August 19, 2008. The violation was of very low safety significance (Green) because: (1) it did not involve as low as reasonably achievable planning or work controls, (2) there was no overexposure, (3) there was no substantial potential for an overexposure, and (4) the ability to assess dose was not compromised. The inspectors concluded that the cause of the finding involved a cross cutting component in the human performance area, H.4, in the area of teamwork and communication and coordination across organizational boundaries, specifically between radiation protection staff and the individual. This resulted in the worker proceeding into areas that they were not briefed to enter

which contained unknown dose rates.
Inspection Report# : 2017001 *(pdf)*

Public Radiation Safety

Security

The security cornerstone is an important component of the ROP, which includes various security inspection activities the NRC uses to verify licensee compliance with Commission regulations and thus ensure public health and safety. The Commission determined in the staff requirements memorandum (SRM) for SECY-04-0191, "Withholding Sensitive Unclassified Information Concerning Nuclear Power Reactors from Public Disclosure," dated November 9, 2004, that specific information related to findings and performance indicators associated with the security cornerstone will not be publicly available to ensure that security-related information is not provided to a possible adversary. Security inspection report cover letters will be available on the NRC Web site; however, security-related information on the details of inspection finding(s) will not be displayed.

Miscellaneous

Current data as of : November 29, 2017

Page Last Reviewed/Updated Monday, November 06, 2017