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## D.C. Cook 2 – Quarterly Plant Inspection Findings

### 2Q/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 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:** G Mar 31, 2017

Identified By: Self-Revealing

Item Type: NCV Non-Cited Violation

### **Failure to Control Nonconforming 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*)

**Significance:**  Sep 30, 2016

Identified By: Self-Revealing

Item Type: NCV Non-Cited Violation

#### **Wetting of Safety-Related Battery Charger**

A finding of very low safety significance with an associated NCV of TS 5.4, Procedures, was self revealed on June 21, 2016, when safety related N Train Battery Charger 2-BC-B was found soaked with water from a roof leak above. The licensee failed to follow administrative procedures for control of temporary catch basins. TS 5.4 states, 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 maintenance that can affect the performance of safety related equipment should be properly preplanned and performed in accordance with written procedures, documented instructions, or drawings appropriate to the circumstances. Contrary to this requirement, the licensee installed and subsequently removed a drip catch above battery charger 2-BC-B that was being used to protect the charger from a water leak in the area pending roof repairs. On June 3, 2016, the Performance Assurance department noted the catch had been installed outside of any formal process. In response, the licensee removed the catch but did not put anything in its place to protect the charger. On June 21, 2016, a severe rainstorm occurred, resulting in the wetting of the charger. The other charger was in service at the time, so there was no impact to the affected N Train distribution system. In response, the licensee added another protective device, dried out, inspected, and tested the charger. It was restored to operable status on June 23.

The issue was more than minor because it adversely affected the Protection Against External Factors attribute of the Mitigating Systems cornerstone, whose objective is 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 as Green, or very low safety significance, because there was no loss of system operability. The finding had an associated cross cutting aspect in the Human Performance area, specifically, H.7., Documentation. Had the licensee kept their leak detection log up to date with the addition of the catch over the charger initially, it would have prompted the licensee to ensure the repairs to the roof were complete before removing the barrier. Further, it would not have been identified as an issue by Performance Assurance.

Inspection Report# : 2016003 (*pdf*)

**Significance:**  Sep 02, 2016

Identified By: NRC

Item Type: NCV Non-Cited Violation

#### **Inadequate Resolution for Double-Break Circuits Design for Several Valves**

The inspectors identified a finding of very-low safety significance (Green) and an associated Non-Cited Violation of license conditions 2.C(4) and 2.C(3)(o) for the licensee's failure to implement the approved. Specifically, the licensee

failed to analyze the double break circuits design for valves using risk-informed, performance-based techniques for several fire areas. In the event of a fire in several fire areas, fire induced circuit failures (i.e., inter-cable shorting) for a double-break design for several valves (i.e., Power Operated Relief Valves) could potentially result in spurious operation of the valves. The circuit analysis for these valves in these areas was analyzed using the deterministic approach instead risk-informed, performance-based techniques. The licensee entered the issue into their Corrective Action Program and took credit for existing fire protection features and controls as compensatory measures and planned to review the multiple spurious operations Expert Panel Report and properly disposition the scenario.

The performance deficiency was determined to be more-than-minor because if left uncorrected, it would potentially lead to a more significant safety concern. Specifically, the failure to properly evaluate and disposition all potential fire-induced circuit failures for all cables in a fire area could impair the plant's ability to safely shutdown in the event of a fire. The performance deficiency was also associated with the Mitigating Systems cornerstone. The finding was of very -low safety significance because it did not impact the reactor's ability to reach and maintain a safe shutdown condition. This finding did not have a cross-cutting aspect because it was not representative of current licensee performance. (Section 1R05.6.b)

Inspection Report# : 2016009 (*pdf*)

## **Barrier Integrity**

**Significance:**  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:**  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 : August 03, 2017

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