

## D.C. Cook 2

### 4Q/2013 Plant Inspection Findings

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## Initiating Events

**Significance:** G Sep 30, 2013

Identified By: Self-Revealing

Item Type: FIN Finding

### **Reactor Trip Due to Improper Control Valve Setpoint**

A self revealed finding of very low safety significance occurred because the licensee failed to program the automatic controller for the condensate heater condensate bypass control valve, 2 CRV 224, with the correct setpoint. Specifically, the automatic controller (2 RU 2) setpoint was not set at the required 240 psig because licensee personnel incorrectly interpreted information in SD ENG 05400, "System Description Condensate System." Consequently, an incorrect set point of 188 psig was incorporated in procedure 2-OHP-4021-001-006, "Power Escalation," which was used to program the automatic controller. As a result, 2 CRV 224 did not open as designed to mitigate the lowering main feedwater pump suction pressure, which resulted in the west main feedwater pump tripping on low suction pressure and a subsequent manual reactor trip. For corrective actions, the licensee programmed the correct setpoint into the automatic controller; revised the associated procedures to ensure setpoint changes are accurately incorporated and reviewed prior to implementation; developed plans to communicate lessons learned to the site; and entered the condition into the CAP.

Using IMC 0612 the inspectors determined that this issue was more than minor because it was associated with the design control attribute of the Initiating Events Cornerstone and it adversely affected the cornerstone objective to limit the likelihood of events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. Specifically, failure to set the 2-CRV-224 automatic controller to the design setpoint of 240 psig resulted in the subsequent loss of the west main feedwater pump during a feedwater heater level transient, which caused steam generator water levels to lower and required the operators to manually trip the reactor. The inspectors determined the finding was of very low safety significance (Green) using Exhibit 1 of IMC 0609, Appendix A, because the finding did not cause both a reactor trip and a loss of mitigating equipment. The inspectors concluded that this finding was associated with an aspect in the Resources component of the Human Performance cross cutting area. Specifically, the procedure used to program the automatic controller for 2 CRV 224 was not accurate in that it did not contain the correct design setpoint

Inspection Report# : [2013004](#) (*pdf*)

**Significance:** G Jul 26, 2013

Identified By: NRC

Item Type: NCV NonCited Violation

### **Evaluate Routing of Fiber Optic Cable in Combustible Exclusion Zone.**

The inspectors identified a finding of very low safety significance (Green) and associated NCV of Technical Specification 5.4.1.d, "Procedures," for the failure to control combustibles in accordance with a Fire Protection Program (FPP). Specifically, the licensee failed to obtain the FPP engineering review when they routed a fiber optics cable in a combustible exclusion area which was designated to establish separation between two fire areas required per 10 CFR Part 50, Appendix R. A twenty feet separation space with no intervening combustibles was located between Fire Areas AA36 and AA42 in the Auxiliary Building at 609 foot elevation. The licensee subsequently entered the

issue into their Corrective Action Program and performed a preliminary evaluation of this issue and concluded that the cable routing did not affect the requirements of the FPP.

The inspectors determined that this finding was more than minor because if left uncorrected, it would become a more significant safety concern. Specifically, the licensee's failure to perform an engineering evaluation when introducing combustibles in the combustible exclusion zone or safety-related areas could potentially affect the validity of future evaluations. The inspectors determined that the finding screened as having very-low-safety significance in Task 1.3.1 of IMC 0609, Appendix F. This finding has a cross-cutting aspect in the area of human performance, work control, because the licensee failed to coordinate the routing of the fiber optics cable through a combustible exclusion area with the Fire Protection Engineer (FPE).

Inspection Report# : [2013009](#) (*pdf*)

## Mitigating Systems

**Significance:**  Sep 30, 2013

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

### **Unit 2 Steam Generator #1 Stop Valve Dump Valve 2-MRV-212 Stroke Time Failure due to Operation of Dump Valve Outside its Packing Design**

A self revealed finding of very low safety significance (Green) and associated NCV of Technical Specification (TS) 5.4.1 occurred because the licensee failed to establish, implement, and maintain procedures regarding proper steam generator stop valve dump valve preventative maintenance. Specifically, the licensee improperly packed Unit 2 steam generator #1 stop valve dump valve, 2-MRV-212, which resulted in three consecutive in-service test surveillance testing failures, (October 26, 2012, January 26, 2013, and April 25, 2013). Each testing failure resulted in the valve being declared inoperable. The testing failures occurred because the maintenance procedure used during the valve packing activity, 12 MHP 5021 005 003, "Valve Packing Removal, Installation and Adjustment," did not provide instructions on the appropriate number of packing rings to be installed. Corrective action included repacking the valve with the correct number of packing rings and initiating corrective action document AR 2013 6243.

Using Inspection Manual Chapter (IMC) 0612, the inspectors determined that this issue was more than minor because it was associated with the equipment performance attribute of the Mitigating Systems Cornerstone and it impacted the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to events. Specifically, the performance deficiency resulted in an inoperable steam generator stop valve dump valve. The inspectors determined that this issue was of very low safety significance (Green) because the inspectors answered no to all the screening questions in IMC 0609, Appendix A, Exhibit 2. The inspectors concluded that this issue had an aspect in the Corrective Action Program component of the Problem Identification and Resolution cross-cutting area, because the licensee failed to correct the cause of the slow stroke time on two prior surveillance failures.

Inspection Report# : [2013004](#) (*pdf*)

**Significance:**  Sep 30, 2013

Identified By: Self-Revealing

Item Type: FIN Finding

### **Faulted 4KV Qualified Off-site Circuit**

A finding of very low safety significance was self-revealed on April 24, 2013, because the licensee failed to comply with requirements contained in procedure PMI 7030, "Corrective Action Program," prior to restoring power to the

Unit 1 reserve auxiliary transformer CD-101. Specifically, following multiple trips of supply breaker 12 CD, the licensee failed to correct an issue, defined as a condition adverse to quality in their corrective action program, prior to restoring power to the transformer on April 21. This ultimately led to the supply breaker to the Unit 1 and 2 reserve auxiliary transformers opening due to a faulted cable. No violations of NRC requirements were identified for this issue since the degraded cable was on a non-safety related portion of the electrical system. The licensee entered the issue into the corrective action program as AR 2013 6194. The corrective actions for this issue included replacing the faulted cables and testing the unaffected cables.

Using IMC 0612, the inspectors concluded that the issue was more than minor because it was associated with the equipment performance attribute of the Mitigating System Cornerstone and it adversely impacted the cornerstone objective of ensuring the availability, reliability and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the degraded insulation failed causing a loss of the qualified circuit; a condition which lessened the likelihood of its availability for some events. Using IMC 0609, Appendix A, Section 6, a detailed risk evaluation, assuming inoperability of four days, determined the delta Core Damage Frequency was less than  $1E6$ ; therefore the finding screens as very low safety significance (Green). The inspectors concluded this finding was associated with an aspect in Operating Experience component of the Problem Identification and Resolution cross-cutting area because the licensee did not implement and institutionalize operating experience information from the Electric Power Research Institute (EPRI) and Institute of Electrical and Electronics Engineers (IEEE) into processes and procedures.

Inspection Report# : [2013004](#) (pdf)

**Significance:**  Sep 30, 2013  
 Identified By: Self-Revealing  
 Item Type: NCV NonCited Violation

**Inadvertent Operation of Plant Equipment**

A self revealed finding of very low safety significance and associated non-cited violation of TS 5.4.1 occurred because the licensee failed to implement procedures for equipment control. Specifically, plant workers caused two unplanned Limiting Conditions for Operation (LCO) entries due to inadvertent equipment operation that resulted from inadequate implementation of procedures for equipment control. The first inadvertent equipment operation rendered the Unit 1 west motor driven auxiliary feedwater (AFW) pump inoperable for approximately 14 minutes; the second inadvertent equipment operation rendered one qualified offsite electrical circuit inoperable to both units for approximately 30 minutes. For corrective actions, in both cases, the licensee restored the equipment to an operable status and communicated the errors to site personnel to improve worker situational awareness.

Using IMC 0612, Appendix B, the inspectors concluded that the issue was more than minor because it was associated with the equipment performance attribute of the Mitigating Systems Cornerstone and adversely impacted the cornerstone objective of ensuring the reliability of systems that respond to initiating events. The inspectors determined that the finding was of very low safety significance (Green) using IMC 0609, Exhibit 2, because the finding: was not a deficiency affecting the design or qualification of a mitigating system; did not represent a loss of system or function; did not represent a loss of function for greater than the technical specification allowed outage time; and did not represent an actual loss of function of one or more non-technical specification trains of equipment designated as high safety-significant. The inspectors concluded that the finding included an aspect in the Work Control component of the Human Performance cross-cutting area because the licensee failed to appropriately plan work using risk insights.

Inspection Report# : [2013004](#) (pdf)

**Significance:**  Jul 26, 2013  
 Identified By: NRC

Item Type: NCV NonCited Violation

**Propped Open Fire Doors Required Manual Actuation of the CO2 System to Close**

The inspectors identified a finding of very low safety significance (Green) and associated NCV of the D. C. Cook Nuclear Power Plant facility operating licensee conditions for the Fire Protection Program for the licensee's failure to ensure fire doors that were propped open will automatically close at time of a fire. Specifically, Fire Doors 1-DR-AUX471 and 2-DR-AUX472 were found propped open and held by fusible links and CO2 devices. In the event of a fire in either Fire Area AA40 or Fire Area AA43, the associated door would not automatically close due to the location of the fusible link, and the CO2 pop-off devices would activate when the CO2 System is manually actuated. The licensee subsequently entered the issue into their Corrective Action Program and established fire tours of the affected fire areas.

The inspectors determined that this finding was more than minor because the failure to ensure the propped open fire doors would automatically close in the event of a fire did not ensure that the fire would not spread between the adjacent fire areas separated by the doors and could have potentially compromised the ability to safely shutdown the plant. Based on the Detailed Risk-Evaluation completed by the Region III Senior Reactor Analysts (SRA), the inspectors determined the finding was of very low safety significance (Green) because the resulting change in the Core Damage Frequency (?CDF) was less than 1E-6/yr. The finding did not have a cross-cutting aspect because it was not reflective of current performance.

Inspection Report# : [2013009](#) (pdf)

**Significance:**  Jul 26, 2013

Identified By: NRC

Item Type: NCV NonCited Violation

**Failure to Assure that a Second Fire Pump would Start upon Demand at the Setpoint**

The inspectors identified a finding of very low safety significance (Green) and associated NCV of the D. C. Cook Nuclear Power Plant facility operating licensee conditions for the Fire Protection Program for the licensee's failure to ensure fire doors that were propped open will automatically close at time of a fire. Specifically, Fire Doors 1-DR-AUX471 and 2-DR-AUX472 were found propped open and held by fusible links and CO2 devices. In the event of a fire in either Fire Area AA40 or Fire Area AA43, the associated door would not automatically close due to the location of the fusible link, and the CO2 pop-off devices would activate when the CO2 System is manually actuated. The licensee subsequently entered the issue into their Corrective Action Program and established fire tours of the affected fire areas.

The inspectors determined that this finding was more than minor because the failure to ensure the propped open fire doors would automatically close in the event of a fire did not ensure that the fire would not spread between the adjacent fire areas separated by the doors and could have potentially compromised the ability to safely shutdown the plant. Based on the Detailed Risk-Evaluation completed by the Region III Senior Reactor Analysts (SRA), the inspectors determined the finding was of very low safety significance (Green) because the resulting change in the Core Damage Frequency (?CDF) was less than 1E-6/yr. The finding did not have a cross-cutting aspect because it was not reflective of current performance.

Inspection Report# : [2013009](#) (pdf)

**Significance:**  Jul 26, 2013

Identified By: NRC

Item Type: NCV NonCited Violation

**Failure to Incorporate Required Shutdown Guidance into Fire Response Procedure.**

The inspectors identified a finding of very low safety significance (Green) and associated NCV of Technical

Specification 5.4.1.d, "Procedures," for the licensee's failure to provide adequate guidance required for safe shutdown in the response procedures. Specifically, the licensee failed to provide adequate guidance to reset the associated Emergency Diesel Generator (EDG) lockout relays to support EDG operation, which were required to power safe shutdown components to achieve shutdown in the event of a fire in either Fire Zones 79 or 85 for Units 1 or 2 respectively. The licensee subsequently entered the issue into their Corrective Action Program and added steps into the fire response procedure.

The inspectors determined that this finding was more than minor because the failure to provide adequate procedural guidance to reset the EDG lockout relays could have potentially compromised the ability to safely shutdown the plant in the event of a fire. Based on the Detailed Risk Evaluation completed by the Region III SRA, the inspectors determined the finding was of very low safety significance (Green) because the resulting change in the Core Damage Frequency (?CDF) was equal to  $4.17E-9/\text{yr}$ . The finding did not have a cross-cutting aspect because it was not reflective of current performance.

Inspection Report# : [2013009](#) (*pdf*)

**Significance:**  May 31, 2013

Identified By: NRC

Item Type: NCV NonCited Violation

**Failure to Maintain Emergency Operating Procedures for Mitigating the Consequences of a SGTR per TS Section 5.4.1, "Procedures"**

The inspectors identified a finding of very low safety significance, with two associated NCVs of Technical Specification (TS), Section 5.4.1, "Procedures," and TS 3.7.4, "Steam Generator (SG) Power Operated Relief Valves (PORVs)," for the failure to implement design measures which were consistent with the licensing bases for a Steam Generator Tube Rupture (SGTR) concurrent with a Loss of Offsite Power (LOOP) to the station. Specifically, the licensee's emergency operating procedures (EOPs) 1(2) OHP-4023-E-3, "Steam Generator Tube Rupture," failed to provide adequate actions to mitigate the consequences of a SGTR, coincident with a LOOP, in sufficient time to prevent overfilling the ruptured steam generator. Additionally, the licensee failed to declare the affected unit's SG PORVs inoperable and complete the required actions when the non-safety-related control air compressor (CAC) was made unavailable and incapable of providing its required support function. With the unit's CAC unavailable, the SG PORVs would not be capable of being remotely operated from the control room during a SGTR concurrent with the LOOP. The licensee entered this issue into their corrective action program and completed modifications to establish Nitrogen as another motive force to support SG PORV operability.

Inspection Report# : [2013010](#) (*pdf*)

**Significance:**  May 31, 2013

Identified By: NRC

Item Type: NCV NonCited Violation

**Failure to Enter the Limiting Condition for Operations and Perform Required Actions per TS 3.7.4, "SG PORVs."**

This performance deficiency was more than minor because it was associated with the equipment performance attribute of the Mitigating Systems Cornerstone and affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The finding was evaluated using the SDP in accordance with IMC 0609, Appendix A, "The Significance Determination Process for Findings at Power." Based on the Detailed Risk Evaluation required, the inspectors determined the finding was of very low safety significance (Green) because the resulting change in the Core Damage Frequency (CDF) was equal to  $2.4E-8/\text{yr}$ . The inspectors determined the cause of this finding involved the crosscutting area of human performance, the component of decision making, and the aspect of conservative assumptions, H.1(b) in that the licensee did not adopt a requirement to demonstrate that the proposed action is safe in order to proceed rather than a requirement that it is unsafe in order to disapprove the action. Specifically, the licensee incorrectly assumed the unaffected unit's plant air

system (not backed by the emergency diesel generators) would be available during the SGTR scenario to supply motive power to the affected unit's SG PORVs. This assumption failed to take into account the licensing basis requirement of considering a SGTR and a loss of offsite power to the station (both units).

Inspection Report# : [2013010](#) (*pdf*)

**Significance:**  Mar 31, 2013

Identified By: NRC

Item Type: FIN Finding

**Operability Evaluation Relied on Alternate Methods Not Demonstrated to be Technically Appropriate**

The inspectors identified a finding of very low safety significance for the failure to follow operability evaluation procedural guidance. Specifically, an evaluation was conducted for past operability of the residual heat removal and containment spray systems due to the discovery of a void in the containment recirculation sump suction piping. However, the evaluation relied on computer software that has not been benchmarked to demonstrate its applicability to the type of analyses being conducted. This finding was entered into the licensee's Corrective Action Program (CAP) to revise the affected evaluation of past operability. Reanalysis using other appropriate methods determined the piping was operable.

The performance deficiency was more than minor because it was associated with the Mitigating System Cornerstone attribute of equipment performance and adversely affected the cornerstone objective of ensuring the capability of systems that respond to initiating events to prevent undesirable consequences. In addition, the performance deficiency was more than minor because it was associated with the Barrier Integrity cornerstone attribute of structure, system, component, and barrier performance and adversely affected the cornerstone objective of providing reasonable assurance that physical design barriers protect the public from radionuclide releases caused by accidents or events. The finding screened as of very low safety significance (Green) because it was a design deficiency confirmed not to result in loss of operability. Specifically, the licensee performed an alternate operability determination which reasonably concluded the residual heat removal system was operable. In addition, it did not represent an actual open pathway in the physical integrity of reactor containment or involve an actual reduction in function of hydrogen igniters in the reactor containment. This finding did not involve enforcement action because no violation of regulatory requirements was identified. The inspectors did not identify a cross cutting aspect associated with this finding because it was not confirmed to reflect current performance.

Inspection Report# : [2013002](#) (*pdf*)

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## Barrier Integrity

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## Emergency Preparedness

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## Occupational Radiation Safety

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## Public Radiation Safety

## Security

Although the Security Cornerstone is included in the Reactor Oversight Process assessment program, the Commission has decided that specific information related to findings and performance indicators pertaining to the Security Cornerstone will not be publicly available to ensure that security information is not provided to a possible adversary. Other than the fact that a finding or performance indicator is Green or Greater-Than-Green, security related information will not be displayed on the public web page. Therefore, the [cover letters](#) to security inspection reports may be viewed.

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## Miscellaneous

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