

D.C. Cook 1

2Q/2012 Plant Inspection Findings

Initiating Events

Significance:  Mar 31, 2012

Identified By: NRC

Item Type: FIN Finding

Failure to Install a Grommet Seal on the Main Turbine Thrust Bearing Probe

One self revealed finding of very low safety significance was identified for the failure to install a grommet seal on the main turbine thrust bearing probes as required by a site design standard, VTD SKFI 0001, "Eddy Probe Systems Technical Manual," during the Unit 1 2009 turbine failure restoration project. Consequently, oil migrated into the thrust bearing probe conduit, which contributed to a main turbine trip and resultant automatic reactor trip on September 7, 2011. For corrective actions, the licensee separated the main turbine thrust bearing probe cables into separate conduits; wrapped the cables in additional shielding and insulation to prevent signal coupling; and installed sealing glands on the main turbine thrust housing to eliminate oil intrusion into the conduits. This issue was entered into the licensee's corrective action program as Action Request 2011 10107.

This finding was related to the Initiating Events Cornerstone and was more than minor because it adversely affects 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. The finding is associated with the attribute of human performance. Specifically, the failure to install a grommet seal on the main turbine thrust bearing probes contributed to a main turbine trip and resultant automatic reactor trip. This finding was of very low safety significance because the finding does not contribute to both the likelihood of a reactor trip and the likelihood that mitigation equipment will not be available. This finding is associated with a cross cutting aspect in the resources component of the human performance cross cutting area. Specifically, the work order associated with installing the main turbine thrust bearing probes did not include sufficient guidance to ensure that the grommet seal was installed

Inspection Report# : [2012002](#) (*pdf*)

Significance:  Dec 31, 2011

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to Follow Procedure for PT Examination on ASME Class 1 Piping Weld

A finding of very low safety significance and associated NCV of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, procedures, and drawings," was identified by the inspectors on September 27, 2011, for the licensee's failure to follow procedure while performing a liquid dye penetrant (PT) examination on safety injection system piping weld. Specifically, on Unit 1, the examiner conducting the PT examination did not measure and hence, appropriately record indications that were identified during the PT examination. Licensee corrective actions included: re performing the PT examination on the safety injection piping weld, re performing the examiner's prior PT examinations conducted during the current outage to validate the PT examination results, and re train the examiner. This issue was entered into the licensee's corrective action program (CAP) as AR 2011 11130.

The finding was determined to be more than minor because the finding, if left uncorrected, would become a more significant safety concern. Absent NRC identification, the failure to follow the PT examination procedure would have the potential to lead to a more significant safety concern. Specifically, failure to measure and hence, appropriately record all reportable indications leaves the potential to accept components with unacceptable cracks to be returned to service. Cracks in components returned to service would place safety related piping systems at increased risk for through wall leakage and/or failure. The licensee promptly corrected this issue and no components with unacceptable flaws were returned to service. The inspectors answered "No" to the SDP Phase I screening question for operating reactors in the Initiating Events Cornerstone, "Assuming worst case degradation, would the finding result in

exceeding the Technical Specification (TS) limit for any reactor coolant system leakage or could the finding have likely affected other mitigation systems resulting in a total loss of their safety function assuming the worst case degradation”? Therefore, this finding screened as having very low safety significance (Green). This finding has a cross cutting aspect in the area of human performance, work practices, because the licensee contracted vendor did not follow the established PT examination procedure, and the licensee did not ensure appropriate supervisory and management oversight of work activities, including contractors, such that nuclear safety was supported.

Inspection Report# : [2011005](#) (*pdf*)

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Significance: Dec 31, 2011

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

Failure to Follow the Clearance Procedure during Maintenance on Safety-Related Equipment

One self revealed finding of very low safety significance with an associated NCV of TS 5.4.1.a was identified for the failure to implement a procedure required during maintenance on safety-related equipment. The licensee did not follow the clearance procedure while performing maintenance on the Unit 1 reactor vessel head vent assembly. Specifically, workers did not verify that the head vent assembly was isolated from the reactor vessel prior to attempting to remove the vent hose as required by the clearance procedure. Consequently, maintenance workers breached a pressurized system that was not isolated, which resulted in a more than expected amount of reactor coolant being released from the system. For corrective actions the licensee immediately isolated the leak, modified the clearance procedure with additional instructions and communicated lessons learned to the workers. This issue was entered into the licensee’s Corrective Action program (CAP) as AR 2011 12207.

This finding was related to the Initiating Events cornerstone and was more than minor because it adversely affects 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. The finding is associated with the attribute of human performance. Specifically, performing maintenance on a pressurized plant system without verifying the system was properly isolated increased the likelihood of events that challenge plant stability while shutdown. This finding was of very low safety significance because the safety function guidelines for core heat removal, inventory control, power availability, containment integrity, and reactivity control were met in accordance with a phase 1 screening using Appendix G to IMC 0609 for shutdown operations significance determination. This finding is associated with a cross cutting aspect in the work control component of the human performance cross cutting area. Specifically, the outage command center did not adequately coordinate work activities between maintenance and operations to ensure the reactor vessel head vent hose assembly was properly removed

Inspection Report# : [2011005](#) (*pdf*)

Mitigating Systems

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Significance: Jun 30, 2012

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to Replace Post-Accident Monitor Displays

The inspectors identified a finding of very low safety significance and associated NCV for the failure to establish preventive maintenance schedules. Technical Specification (TS) 5.4.1 requires that written procedures be established, implemented and maintained for activities specified in Regulatory Guide 1.33. Regulatory Guide 1.33, Appendix A, section 9, Procedures for Performing Maintenance, states, in part, that “Preventive Maintenance schedules should be developed to specify... inspection or replacement of parts that have a specific lifetime....” The licensee did not develop a maintenance schedule for replacing liquid crystal diodes (LCD) within a manufacturer specified five-year life. Consequently, 14 LCDs failed after about eight years of service and three failures resulted in unplanned Limiting Condition for Operation (LCO) entries. The licensee subsequently replaced the LCDs for safety-related displays and has entered the condition into the corrective action program as AR 2012 5744.

The inspectors concluded that the issue was more than minor because it was associated with the Mitigating Systems cornerstone attribute of Design Control. In addition, it adversely affected the cornerstone objective to ensure the availability and reliability of systems that respond to initiating events. Specifically, the failure to establish and implement scheduled replacement of the LCD displays resulted in three unplanned LCO entries for the affected recorders. The inspectors reviewed the finding in accordance with IMC 0609, Attachment 0609.04 Table 4a for the Mitigating Systems Cornerstone and concluded the finding was of very low safety significance because the answer to all four questions for mitigating structures, systems and components and functionality was 'no'. The inspectors concluded that the finding included a cross-cutting aspect in problem identification and resolution, Corrective Action Program, in that the licensee did not take appropriate corrective actions to address safety issues in a timely manner (P.1(d)). Specifically, the licensee did not replace safety-related LCD displays prior to failure until prompted by the Inspectors.

Inspection Report# : [2012003](#) (pdf)

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Significance: Jun 01, 2012

Identified By: NRC

Item Type: NCV NonCited Violation

Vortexing was not evaluated for the volume control, containment spray additive, refueling water storage tanks.

The inspectors identified a finding of very low safety significance and associated Non-Cited Violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," for the failure to evaluate vortexing in the volume control, containment spray additive, and refueling water storage tanks. Consequently, the minimum allowable submergence for the suction piping of these tanks did not consider the potential for air entrainment due to vortices. This finding was entered into the licensee's corrective action program to evaluate the potential for vortexing at these tanks and revise the affected calculations.

The performance deficiency was determined to be more than minor because it was associated with the Mitigating System cornerstone attribute of equipment performance and affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. In addition, the finding was associated with the Containment Barrier cornerstone attribute of structure, system, component, and barrier performance and 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: (1) the finding examples associated with the volume control and refueling water storage tanks were deficiencies confirmed not to result in loss of operability in that the licensee performed an evaluation that reasonably concluded the current limit setpoints prevent vortexing in these tanks; and (2) the finding example associated with the containment spray (CTA) additive tank was a design deficiency of the physical integrity of the reactor containment that did not affect the barrier function of the control room against smoke or a toxic atmosphere, 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 have an associated cross-cutting aspect because it was not confirmed to reflect current performance due to the age of the performance deficiency.

Inspection Report# : [2012008](#) (pdf)

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Significance: Jun 01, 2012

Identified By: NRC

Item Type: NCV NonCited Violation

Incomplete methodology for developing acceptance criteria for suction voids

The inspectors identified a finding of very low safety significance and associated Non-Cited Violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," for the failure to correctly incorporate the interim methodology for developing acceptance criteria for suction voids in Emergency Core Cooling Systems, Decay Heat Removal, and Containment Spray Systems pumps into procedures. Specifically, the licensee did not translate the limitations of the acceptance criteria with respect to rated performance of pump operation. This finding was entered into the licensee's corrective action program to revise the affected procedure.

The performance deficiency was determined to be more than minor because it was associated with the Mitigating

System cornerstone attribute of equipment performance 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 screened as of very low safety significance (Green) because it was a design deficiency confirmed not to result in loss of operability. Specifically, a review of recent monitoring results determined that identified voids did not exceed the applicable acceptance criteria. The inspectors did not find an applicable cross-cutting aspect which represented the underlying cause of this performance deficiency; therefore, no cross-cutting aspect was assigned.

Inspection Report# : [2012008](#) (pdf)

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Significance: Jun 01, 2012

Identified By: NRC

Item Type: NCV NonCited Violation

Procedures were not developed for performance monitoring of plant parameters.

The inspectors identified a finding of very low safety significance and associated Non-Cited Violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," for the failure to establish minimum flowrate and time required in procedures used to perform dynamic flushing activities affecting Emergency Core Cooling Systems, Decay Heat Removal, and Containment Spray Systems pumps. This finding was entered into the licensee's corrective action program to revise the affected procedures.

The performance deficiency was determined to be more than minor because, if left uncorrected, it would have the potential to lead to a more significant safety concern. Specifically, the failure to establish an appropriate procedure for flushing would have the potential of not removing voids to ensure system operability. 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, a historical review of previous dynamic flushing activities determined that sufficient flowrates and time values were achieved at the appropriate sequences. The inspectors did not identify a cross-cutting aspect associated with this finding because the finding was not confirmed to reflect current performance due to the age of the performance deficiency.

Inspection Report# : [2012008](#) (pdf)

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Significance: Jun 01, 2012

Identified By: NRC

Item Type: NCV NonCited Violation

Minimum flowrates and time requirements for dynamic flushing were not established

The inspectors identified a finding of very low safety significance and associated Non-Cited Violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," for the failure to include adequate venting instructions in the procedure use to respond to a MODE 4 loss-of-coolant accident. Specifically, the procedure did not include instructions to address all of the affected residual heat removal system high points, including the discharge piping. The finding was entered into the licensee's corrective action program to leave one train of the system idle while the other train cools down the reactor coolant system below 200°F to ensure that the discharge side of one train of residual heat removal system is not vulnerable to steam formation.

The performance deficiency was determined to be more than minor because, if left uncorrected, it would have the potential to lead to a more significant safety concern. The finding screened as of very low safety significance (Green) using a Phase II evaluation. The inspectors determined that this finding had a cross-cutting aspect in the area of problem identification and resolution because the licensee did not thoroughly evaluate relevant external operating experience. Specifically, the licensee's evaluation of Information Notice 2010-11 incorrectly concluded that procedures contained sufficient direction to preclude flashing.

Inspection Report# : [2012008](#) (pdf)

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Significance: Jun 01, 2012

Identified By: NRC

Item Type: NCV NonCited Violation

Inadequate Procedure for Responding to a MODE 4 LOCA

The inspectors identified a finding of very low safety significance and associated Severity Level IV violation of 10 CFR 50.59, "Changes, Tests, and Experiments," for the failure to perform a written evaluation, which provided the bases for the determination that a change did not require a license amendment. Specifically, the licensee failed to provide a basis for not applying for a license amendment associated with a modification of the residual heat removal pump casing drain lines. The finding was entered into the licensee's corrective action program to: (1) stage a hose and pipe couplings to support venting at the residual heat removal pump casing vent; (2) create a work order request to flush flow through the abandoned drain lines that were cut from the pump casing vent to show the lines could still pass water; (3) develop an alternate means to accomplish this activity; and (4) evaluate the change.

The performance deficiency was determined to be more than minor because it was associated with the Mitigating System cornerstone attribute of equipment performance and affected the cornerstone objective of ensuring the capability and availability of systems that respond to initiating events to prevent undesirable consequences. Violations of 10 CFR 50.59 are dispositioned using the traditional enforcement process instead of the significance determination process because they are considered to be violations that potentially impede or impact the regulatory process. The finding screened as of very low safety significance (Green) using a Phase II evaluation. The inspectors did not identify a cross-cutting aspect associated with this finding because the finding was not confirmed to reflect current performance due to the age of the performance deficiency.

Inspection Report# : [2012008](#) (pdf)

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Significance: Jun 01, 2012

Identified By: NRC

Item Type: NCV NonCited Violation

10 CFR 50.59 evaluation for modification of RHR pump casing drain lines was not performed

The inspectors identified a finding of very low safety significance and associated Severity Level IV violation of 10 CFR 50.59, "Changes, Tests, and Experiments," for the failure to perform a written evaluation, which provided the bases for the determination that a change did not require a license amendment. Specifically, the licensee failed to provide a basis for not applying for a license amendment associated with a modification of the residual heat removal pump casing drain lines. The finding was entered into the licensee's corrective action program to: (1) stage a hose and pipe couplings to support venting at the residual heat removal pump casing vent; (2) create a work order request to flush flow through the abandoned drain lines that were cut from the pump casing vent to show the lines could still pass water; (3) develop an alternate means to accomplish this activity; and (4) evaluate the change.

The performance deficiency was determined to be more than minor because it was associated with the Mitigating System cornerstone attribute of equipment performance and affected the cornerstone objective of ensuring the capability and availability of systems that respond to initiating events to prevent undesirable consequences. Violations of 10 CFR 50.59 are dispositioned using the traditional enforcement process instead of the significance determination process because they are considered to be violations that potentially impede or impact the regulatory process. The finding screened as of very low safety significance (Green) using a Phase II evaluation. The inspectors did not identify a cross-cutting aspect associated with this finding because the finding was not confirmed to reflect current performance due to the age of the performance deficiency.

Inspection Report# : [2012008](#) (pdf)

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Significance: Jun 01, 2012

Identified By: NRC

Item Type: FIN Finding

10 CFR 50.59 evaluation for modification of RHR pump casing drain lines was not performed

The inspectors identified a finding of very low safety significance and associated Severity Level IV violation of 10 CFR 50.59, "Changes, Tests, and Experiments," for the failure to perform a written evaluation, which provided the bases for the determination that a change did not require a license amendment. Specifically, the licensee failed to provide a basis for not applying for a license amendment associated with a modification of the residual heat removal pump casing drain lines. The finding was entered into the licensee's corrective action program to: (1) stage a hose and

pipe couplings to support venting at the residual heat removal pump casing vent; (2) create a work order request to flush flow through the abandoned drain lines that were cut from the pump casing vent to show the lines could still pass water; (3) develop an alternate means to accomplish this activity; and (4) evaluate the change.

The performance deficiency was determined to be more than minor because it was associated with the Mitigating System cornerstone attribute of equipment performance and affected the cornerstone objective of ensuring the capability and availability of systems that respond to initiating events to prevent undesirable consequences. Violations of 10 CFR 50.59 are dispositioned using the traditional enforcement process instead of the significance determination process because they are considered to be violations that potentially impede or impact the regulatory process. The finding screened as of very low safety significance (Green) using a Phase II evaluation. The inspectors did not identify a cross-cutting aspect associated with this finding because the finding was not confirmed to reflect current performance due to the age of the performance deficiency.

Inspection Report# : [2012008](#) (*pdf*)

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Significance: Jun 01, 2012

Identified By: NRC

Item Type: NCV NonCited Violation

Inadequate Procedure for RCS Vacuum Fill During Reduced Inventory Operations

The inspectors identified a finding of very low safety significance and associated Non-Cited Violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," for failure to establish procedures for reduced inventory operations that were appropriate to preclude air entrainment into Residual Heat Removal (RHR) and Reactor Coolant Systems (RCS). Specifically, a procedure allowed operation of RHR while in reduced inventory operations with a minimum RCS level and maximum pump flowrate combination that was determined to result in air-entrainment vortices. The finding was entered into the licensee's corrective action program to place an administrative hold to the procedure until proper documentation is revised and updated and to revise the procedure to require stricter use of high accuracy level instrumentation.

The performance deficiency was determined to be more than minor because it was associated with the initiating event cornerstone attribute of procedure quality and affected the cornerstone objective of limiting the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown operations. The finding screened as of very low safety significance (Green) using a Phase II evaluation. The inspectors did not identify a cross-cutting aspect associated with this finding because the finding was not confirmed to reflect current performance due to the age of the performance deficiency.

Inspection Report# : [2012008](#) (*pdf*)

Barrier Integrity

Emergency Preparedness

Occupational Radiation Safety

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.

Miscellaneous

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