

Arkansas Nuclear 2

1Q/2013 Plant Inspection Findings

Initiating Events

Significance:  Dec 31, 2012

Identified By: NRC

Item Type: FIN Finding

Failure to Adequately Evaluate Discolored Boric Acid on Reactor Make-up Water Pipe

Inspectors identified a finding for the failure to perform an adequate boric acid evaluation on the reactor make-up water pipe located in the overhead of the train B charging pump room. The licensee entered this finding into their corrective action program as Condition Report ANO-C-2012-03119.

Inspectors determined that the failure to adequately evaluate the red/brown discoloration near a reactor make-up water pipe fillet weld and demonstrate that the structural integrity of the weld/pipe was not adversely impacted was a performance deficiency. This finding was more than minor because it is associated with the Initiating Events cornerstone attribute of performance and affects the cornerstone objective to limit the likelihood of those events that upset plant stability and that challenge critical safety functions during power operations and if left uncorrected, the performance deficiency would have the potential to lead to a more significant safety concern. Specifically, if licensee personnel continue to perform boric acid evaluations under the assumption that red/brown discoloration on stainless steel pipe at low temperature is not indicative of localized corrosion, a more significant instance of corrosion on stainless steel pipe may not be appropriately evaluated and corrected. Using Manual Chapter 0609, Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," the finding was determined to be of very low safety significance (Green) because the finding could not result in exceeding the reactor coolant system leak rate for a small loss-of-coolant accident, nor could the finding have likely affected other systems used to mitigate a loss-of-coolant accident resulting in a total loss of their function. This finding had a cross-cutting aspect in the area of human performance, associated with the decision-making component, because the licensee failed to use conservative assumptions in decision-making and adopt a requirement to demonstrate that the proposed action is safe in order to proceed rather than a requirement to demonstrate that it is unsafe in order to disprove the action. Specifically, the licensee inappropriately assumed that the red/brown discoloration on the reactor make-up water line was staining by migrating particulate without fully evaluating other possible causes of the discoloration [H.1(b)].

Inspection Report# : [2012005](#) (*pdf*)

Significance:  Dec 31, 2012

Identified By: Self-Revealing

Item Type: FIN Finding

Failure to Correct a Degraded Condition Associated with the Unit 2 Condenser Vacuum Pump Solenoid Valves Results in Reactor Trip

The inspectors documented a self-revealing finding for the failure to identify the cause and take appropriate corrective actions to address the degraded performance of the Unit 2 condenser vacuum pump solenoid valves. Specifically, from 2008 through 2012, Unit 2 operations staff identified the degraded performance of several solenoid valves associated with the condenser vacuum pumps. These performance issues were entered into the corrective action program a number of times during this period. On August 8, 2012, while switching condenser vacuum pumps for oil checks, two solenoid valves failed to close resulting in a turbine trip and an automatic trip of the reactor. The licensee

has entered this issue into the corrective action program as Condition Report CR-ANO-2-2012-1429.

The failure to identify the cause and take appropriate corrective actions to address the degraded performance of the Unit 2 condenser vacuum pump solenoid valves is determined to be a performance deficiency. The performance deficiency is determined to be more than minor because it is associated with the equipment performance attribute of the Initiating Events Cornerstone and adversely affected the cornerstone objective to limit the likelihood of events that upset plant stability and challenged critical safety functions during power operations, and is therefore a finding. Using Manual Chapter 0609, Attachment 4, "Initial Characterizations of Findings," and Appendix A, "The Significance Determination Process (SDP) for Findings at Power," the finding was determined to have very low safety significance (Green) because, although it resulted in a reactor trip, it did not result in the loss of mitigating equipment relied upon to transition the plant from the onset of the trip to a stable shutdown condition. The finding does not have a cross-cutting aspect because none were determined to be appropriate

Inspection Report# : [2012005](#) (*pdf*)

Significance: G Dec 31, 2012

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

Failure to Provide an Accurate Maintenance Tagout Results in Loss of Reactor Coolant System Inventory

The inspectors documented a self-revealing non-cited violation of 10 CFR Part 50, Appendix B, Criterion V, for the failure to provide an appropriate maintenance tagout. Specifically, maintenance tagout LPSI-013-A-2SI-14C for maintenance on the Unit 2 low pressure safety injection header C incorrectly specified that the reactor coolant system level should be less than 70 inches to work on the low pressure safety injection header components which resulted in a loss of reactor coolant system inventory. The licensee has entered this issue into the corrective action program as Condition Report CR-ANO-2-2012-2645.

The failure to provide an appropriate tagout for maintenance on the low pressure safety injection header was a performance deficiency. Specifically, the reactor coolant system level should have been lowered to less than 65 inches rather than less than 70 inches, as stated in the tagout, to prevent the loss of reactor coolant inventory. The performance deficiency is more than minor because it is associated with the configuration control attribute of the Initiating Events Cornerstone and adversely affected the cornerstone objective to limit the likelihood of events that upset plant stability and challenge critical safety functions during power operations, and is therefore a finding. Using Manual Chapter 0609, Attachment 4, "Initial Characterization of Findings," and Appendix G, "Shutdown Operation," Attachments 1 and 2, it was determined that because this finding increased the likelihood of a loss of RCS inventory, especially during reduced inventory condition, a Phase 2 analysis was required. The senior reactor analyst determined the finding to have very low safety significance (Green) because even without operator action residual heat removal would not have been lost and there were no other complicating issues. The finding has a cross-cutting aspect in the area of human performance, associated with the resources component, in that the licensee failed to ensure that personnel equipment, procedures, and other resources are available and adequate to assure nuclear safety. Specifically, station Procedure OP-2103.011, "Draining the Reactor Coolant System," Revision 48, was not up to date and accurate for determining the appropriate reactor vessel level for the development of the maintenance tagout

Inspection Report# : [2012005](#) (*pdf*)

Mitigating Systems

Significance: G Dec 31, 2012

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to Maintain Licensed Operator Examination Integrity

The inspectors identified a non-cited violation of 10 CFR Part 55.49, "Integrity of Examinations and Tests," for the failure of the licensee to ensure the integrity of Unit 2 licensed operator biennial written examinations. During the 2012 biennial written examination cycle, the exams were administered in a classroom that lacked positive controls to ensure that no one could observe the exam material being administered. Three of the six written exams administered in this room had repeat exam questions and references compared to other weeks' test, and the references used on the exam, were accessed using computer terminals whose screens were viewable if a curtain was not pulled fully closed. Having the ability to view into the room while exam material was being displayed on the computer screens during exam administration is considered an exam integrity compromise. However, an evaluation of the written exam results and interviews with the licensed operators signed in on an exam security agreement showed that the compromise did not have an actual effect on the equitable and consistent administration of the examination. The licensee entered the finding into the corrective action program as Condition Report CR-ANO-C-2012-01834.

The failure of the licensee's training staff to maintain the integrity of examinations administered to licensed operations personnel was a performance deficiency. The finding was more than minor because it adversely affected the Human Performance attribute of the Mitigating Systems cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Additionally, if left uncorrected, the performance deficiency could have become more significant in that allowing licensed operators to return to the control room without valid demonstration of appropriate knowledge on the biennial written examinations could be a precursor to a more significant event. Using NRC Inspection Manual Chapter 0609, "Significance Determination Process," Attachment 4, Tables 1 and 2 worksheets; and the corresponding Appendix I, "Licensed Operator Requalification Significance Determination Process," the finding was determined to have very low safety significance (Green). Although the 2012 finding resulted in a compromise of the integrity of biennial written examinations, with no compensatory actions immediately taken when the compromise should have been discovered, the equitable and consistent administration of the biennial written examination was not actually affected by this compromise. In addition, the failure to meet 10 CFR 55.49 was evaluated through the traditional enforcement process, which resulted in its association with a Severity Level IV (SL-IV) violation consistent with Sections 2.2.4 and 6.4d of the NRC Enforcement Policy. This finding has a crosscutting aspect in the area of resources associated with ensuring that procedures are adequate to ensure nuclear safety. A combination of a NRC procedure review and discussion with the licensee revealed that there are inadequate standardized criteria on site for what minimum actions have to be taken to ensure the subject room is secure prior to and during administration of licensed operator exams. [H.2(c)].

Inspection Report# : [2012005](#) (*pdf*)

Significance:  Dec 31, 2012

Identified By: NRC

Item Type: FIN Finding

Incorrectly Positioned Manual Jack Sleeve Results in Feedwater Regulating Valve not Fully Closing

The inspectors identified a finding associated with a failure to provide sufficient work instructions to perform repairs to 2CV-0748 main feedwater regulating valve. Specifically, contrary to station procedure EN-WM-105, "Planning," Revision 10, the work instructions, generated to repair 2CV-0748 main feed regulating valve incorrectly positioned the manual jack sleeve after repairs and did not provide a sufficient post maintenance test that would verify no new problems were created by the maintenance activity. This prevented the main feedwater regulating valve from fully closing following a Unit 2 trip on August 8, 2012. The licensee has entered this issue into the corrective action program as Condition Report CR-ANO-2-2012-1432.

The failure to provide sufficient work instructions that correctly positioned the manual jack sleeve after repairs and to provide a sufficient post maintenance test that would verify no new problems were created by the maintenance activity is a performance deficiency. The performance deficiency is more than minor because it was associated with the procedure quality attribute of the Mitigating Systems Cornerstone and adversely affected the cornerstone objective to ensure the availability, reliability and capability of systems that respond to initiating events to prevent undesirable

consequences, and is therefore a finding. Using Manual Chapter 0609, Attachment 4 “Initial Characterization of Findings,” and Appendix A “The Significance Determination Process for Findings at Power” the finding was screened against the mitigating systems cornerstone and determined to be of very low safety significance (Green) because the finding did not: 1) result in an actual loss or operability of functionality, 2) represent a loss of system and/or function, 3) represent an actual loss of function of a single train for greater than its technical specification allowed outage time, 4) represent an actual loss of function of one or more non-technical specification trains of equipment designated as high safety-significant for greater than 24 hours and 5) did not involve the loss or degradation of equipment or function specifically designed to mitigate a seismic, flooding or severe weather event. The finding was determined to have a cross-cutting aspect in the area of human performance, associated with work control component, in that the licensee failed to plan and coordinate work activities consistent with nuclear safety. Specifically, the licensee failed to appropriately coordinate work activities by incorporating actions to communicate, coordinate, and cooperate with each other during activities where interdepartmental coordination is necessary to assure plant and human performance by using instructions that incorrectly positioned the manual jacking sleeve fully upward. [H.3(b)].

Inspection Report# : [2012005](#) (pdf)

Significance:  Sep 30, 2012

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to Promptly Identify and Correct a Condition Adverse to Quality with the Unit 2 Vital Inverters

The inspectors identified a non-cited violation of 10 CFR Part 50, Appendix B, Criterion XVI, Corrective Action, for the licensee’s failure to promptly identify and correct a condition adverse to quality associated with the Unit 2 vital inverters. Specifically, in 2010 the licensee failed to identify and correct the cause for a fuse failure and subsequent failure of vital inverters to start that allowed the condition to reoccur in 2011 and 2012. The licensee has placed the issue into their corrective action program as Condition Report CR-ANO-2-2012-0748.

The inspectors determined that the failure to promptly identify and correct a condition adverse to quality associated with the Unit 2 vital inverters is a performance deficiency. Specifically, the licensee failed to identify the cause of the fuse failures and take effective corrective actions in 2010, resulting in the failures in 2011 and 2012. The performance deficiency was more than minor because it was associated with the equipment performance attribute of the Mitigating Systems Cornerstone and adversely affected the cornerstone objective to ensure the availability, reliability and capability of systems that respond to initiating events to prevent undesirable consequences and is therefore a finding. Using Manual Chapter 0609, Attachment 4 “Initial Characterization of Findings,” and Appendix A, “The Significance Determination Process for Findings at Power” the finding was determined to have very low safety significance, Green, because: (1) the finding was a deficiency affecting the design of a mitigating SSC and SSC operability was not maintained, (2) it did not represent a loss of system and/or function, (3) it did not represent an actual loss of function of a single train for greater than its technical specification allowed outage time, (4) it did not represent an actual loss of function of one or more non-technical specification trains of equipment designated as high safety-significant in accordance with the licensee’s maintenance rule program for greater than 24 hours, and (5) it did not involve the loss or degradation of equipment or function specifically designed to mitigate a seismic, flooding, or severe weather event. The finding was determined to have a cross-cutting aspect in the area of human performance, associated with decision making, in that the licensee failed to use conservative assumptions in decision making and failed to verify the validity of the underlying assumptions during effectiveness reviews. Specifically, the licensee assumption that the constant voltage transformer was the cause of the fuse failures was not valid and the condition report closure review accepted the assumption with contrary evidence that the transformer was satisfactory [H.1(b)].

Inspection Report# : [2012004](#) (pdf)

Significance:  Jun 30, 2012

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to Correct a Known Condition Adverse to Quality Associated with Inadequately Secured Splined Adaptors for Service Water Discharge Cross-Connect Valves

The inspectors identified a non-cited violation of 10 CFR Part 50, Appendix B, Criterion XVI for failure to take timely corrective action to correct a condition adverse to quality. Specifically, the licensee implemented a compensatory measure for four service water valves in early 2009 to ensure operability, but has not taken permanent corrective actions to correct the condition adverse to quality for two service water cross-connect valves. The licensee has currently scheduled corrective maintenance for the service water valves in September 2012 and the valves are currently operable. The licensee has placed the issue into their corrective action program as Condition Report CR-ANO-2-2012-1126.

The inspectors determined that the failure to take timely corrective action to correct a condition adverse to quality is a performance deficiency. Specifically, the licensee failed to resolve the degraded condition associated with the splined adaptor for two service water cross-connect valves in the Unit 2 service water intake structure. The performance deficiency is determined to be more than minor because it is associated with the Mitigating System Cornerstone attribute of design control and adversely affects the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences and is therefore a finding. Using Manual Chapter 0609.04, "Phase 1 – Initial Screening and Characterization of Findings," the finding was determined to be of very low safety significance (Green) because the finding: 1) is not a design or qualification deficiency confirmed not to result in an actual loss of operability or functionality, and did not: 2) represent a loss of system safety function, 3) represent an actual loss of safety function of a single train for greater than its technical specification allowed outage time, 4) represent an actual loss of safety function of one or more non-technical specification trains of equipment designated as risk-significant for greater than 24 hours, and 5) screen as potentially risk significant due to an external event. The finding was determined to have a cross-cutting aspect in the area of human performance, associated with work control component, in that the licensee failed to plan and coordinate work activities consistent with nuclear safety. Specifically, the licensee failed to adequately coordinate work activities to support long-term equipment reliability by limiting temporary modifications in that these temporary modifications have been installed for longer than three years (over two outages) [H.3(b)].

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

Barrier Integrity

Significance:  Dec 31, 2012

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to Perform Required Examinations of Reactor Vessel Flange Seal Leak-Off Lines

The inspectors identified a non-cited violation, with two examples, of Title 10 CFR 50.55a(g)(4), which requires that components classified as ASME Code Class 1, Class 2, and Class 3 meet the requirements set forth in Section XI of the applicable editions of the ASME Boiler and Pressure Vessel Code and Addenda. Title 10 CFR 50.55(a)(g)(4)(ii) requires that inservice examination of components be conducted during successive 120-month inspection intervals and comply with the requirements of the latest edition and addenda of the Code applicable to the specific interval. Section XI (of prior and current applicable editions of the Code), Articles IWC-5221 and IWD-5221 require that, for Class 2 and Class 3 components, a system leakage test be performed at the system pressure obtained while the system, or portion of the system, is in service performing its normal operating function. Contrary to the above, prior to September 17, 2012, for the Class 2 and Class 3 reactor vessel flange leak-off lines for both Units 1 and 2, the licensee

failed to perform leakage tests at the system pressure obtained while the system was performing its normal operating function. The licensee has entered this issue into the corrective action program as Condition Report CR-ANO-C-2012-02672.

The inspectors determined that the failure to perform the examinations required by 10 CFR 50.55a(g)(4) on the Units 1 and 2 reactor vessel flange seal leak-off lines is a performance deficiency. The performance deficiency is more than minor because it is associated with the Barrier Integrity Cornerstone attribute of structures, systems, and components and barrier performance and adversely affects the cornerstone objective to provide a reasonable assurance that physical design barriers (fuel cladding, reactor coolant system, and containment) protect the public from radionuclide releases caused by accidents or events. Using Manual Chapter 0609, Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," the finding was determined to be of very low safety significance (Green) because the finding could not result in exceeding the reactor coolant system leak rate for a small loss-of-coolant accident, nor could the finding have likely affected other systems used to mitigate a loss-of-coolant accident resulting in a total loss of their function. This issue did not have a cross-cutting aspect associated with it because it is not indicative of current performance

Inspection Report# : [2012005](#) (*pdf*)

Emergency Preparedness

Occupational Radiation Safety

Significance:  Dec 31, 2012

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

Radiation Workers Fail to Follow High Radiological Area Procedure

The inspectors documented a self-revealing non-cited violation of Unit 2 Technical Specification 6.4.1.a for the failure to follow station procedure EN-RP-100 "Radiation Worker Expectations", Revision 7. Specifically, when a worker is working in a posted high radiation area a worker received several electronic dose rate alarms and failed to immediately exit the area, notify others in the work area and notify radiological protection personnel of the dose rate alarm. The licensee has entered this issue into the corrective action program as Condition Report CR-ANO-2-2012-2830.

Radiation workers failing to follow station procedure EN-RP-100 "Radiation Worker Expectations", Revision 7, when receiving electronic dose rate alarms in posted high radiation areas and failing to immediately exit the area, notify others in the work area and notify radiological protection personnel of the alarm is a performance deficiency. This finding is more than minor because it affected the human performance attribute of the Occupational Radiation Cornerstone and adversely affected the cornerstone objective to ensure the adequate protection of the worker health and safety from exposure to radiation from radioactive material during routine civilian nuclear reactor operation. Using Manual Chapter 0609, Appendix C, "Occupational Radiation Safety Significance Determination Process," the finding was determined to have very low safety significance (Green) because: (1) the finding was not related to as-low-as-reasonably-achievable planning, work control or exposure control (2) did not involve an overexposure, (3) did not involve a substantial potential for overexposure, and (4) did not compromise the licensee's ability to assess dose. The finding was determined to have a cross-cutting aspect in the area of human performance, associated with work practices component, self and peer checking. Specifically, the radiation workers failed to use self or peer check techniques to ensure that personnel do not proceed in the face of unexpected circumstances when they failed to respond to several dose rate alarms while in a posted radiation area. [H.4(a)].

Inspection Report# : [2012005](#) (*pdf*)

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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