Arkansas Nuclear 2
4Q/2014 Plant Inspection Findings

Initiating Events

Significance: G Sep 30, 2014
Identified By: Self-Revealing
Item Type: NCV NonCited Violation
Failure to Implement Procedural Requirements for Axial Shape Index during a Rapid Power Reduction
The inspectors documented a Green self-revealing non-cited violation of Technical Specification 6.4.1.a for the failure to implement procedures for changing load recommended by Regulatory Guide 1.33, Revision 2, Appendix A, Section 2.f, dated February 1978. Specifically, the licensee did not maintain axial shape index within the limits of the core operating limits report during a rapid power reduction at the end of core life, resulting in an automatic reactor trip. The issue was documented in Condition Report
CR-ANO-C-2014-01142.

The inspectors determined that the failure to maintain axial shape index within the limits of the core operating limits report during a rapid power reduction was a performance deficiency. The performance deficiency is more than minor because it is associated with the human performance attribute of the Initiating Events Cornerstone and adversely affected the cornerstone objective to limit the likelihood of events that upset plant stability and challenge the critical safety functions during shutdown as well as power operations. Specifically, the failure to maintain axial shape index caused an automatic reactor trip. Using Manual Chapter 0609, Attachment 4, "Initial Characterization of Findings," and Appendix A, "The Significance Determination Process (SDP) for Findings at Power," Exhibit 1, "Initiating Events Screening Questions," the inspectors determined the finding to be of very low safety significance (Green) because the finding did cause a reactor trip but did not cause a loss of mitigation equipment relied upon to transition the plant from the onset of the trip to a stable shutdown condition.

The finding has a cross-cutting aspect in the area of human performance associated with training because the organization did not provide training and ensure knowledge transfer to maintain a knowledgeable, technically competent workforce. Specifically, the operators were not trained to understand the effects of the axial shape index during rapid power reductions with a core at an End-of-Life condition [H.9]

Inspection Report# : 2014004 *(pdf)*

Significance: G Jun 29, 2014
Identified By: NRC
Item Type: NCV NonCited Violation
Failure to Follow Procedures for Through Wall Leaks
The inspectors identified a non-cited violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," with two examples. Criterion V, states, in part, "Activities affecting quality shall be prescribed by documented instructions, procedures, or drawings, of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions, procedures, or drawings." Contrary to the above, the licensee failed to accomplish operability and functionality assessments in accordance with Procedure EN-OP-104, Revision 7, "Operability Determination Process."

Example 1. In March of 2013, the licensee identified that the reactor coolant sample cooler E30 was leaking reactor coolant into the nuclear intermediate cooling water system. In the operability/functionality assessment, the licensee stated, in part, that the nuclear intermediate cooling water system was not safety-related and that the system was not part of the reactor coolant system pressure boundary; therefore, this was not within the scope of the operability determination process. No functionality assessment of the reactor coolant system sample system was performed.

Example 2. Two through wall leaks in the reactor coolant system supply line to the reactor coolant sample cooler 2E30 were identified on February 3, 2014. After a visual inspection of the leaks in the reactor coolant sample system, the licensee documented the following information in the operability description of Condition Report CR ANO 2-2014-00268: “For the stated condition, the Reactor Coolant System (RCS) and the Unit 2 Containment Building are OPERABLE. No Degraded or Nonconforming Condition exists per Procedure EN-OP-104, Revision 7 Attachment 9.1, Table 1.” The licensee did not perform a functionality assessment of the reactor coolant sample system as required by Procedure EN-OP-104. The sample system was the system directly affected by the degraded condition. When this assessment was challenged by the NRC inspectors and the licensee’s ability to meet the Technical Specification Surveillance Requirement 4.4.8.1 for dose equivalent xenon which is required once per seven days, as well as the acceptability of the system for continued service, the licensee recognized that the permanent repairs to the sample system would not be completed by the time the next sample was required.

For the Unit 1 sample system, the licensee performed a functionality assessment and the system remained functional with the current leak rate. For the Unit 2 sample system, the system was isolated and the flaws were repaired. This issue was documented in Condition Report CR-ANO-C-2014-1800.

The inspector determined that the failure to perform functional assessments of the Unit 1 and 2 reactor coolant sampling systems was a performance deficiency. The finding was more than minor because it was associated with the human performance 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 shutdown as well as power operations. Specifically, the leakage could result in the inability to sample the reactor coolant for activity which would upset plant stability by causing an unplanned shutdown as required by technical specifications. Using Inspection Manual Chapter 0609, Attachment 4, “Initial Characterization of Findings,” dated June 19, 2012, and Appendix A, “The Significance Determination Process (SDP) for Findings At-Power,” dated June 19, 2012, Exhibit 1, “Initiating Events Screening Questions,” the inspectors determined that the finding was of very low safety significance (Green) because the finding did not result in a reactor trip and the loss of mitigation equipment relied upon to transition the plant from the onset of a trip to a stable shutdown condition.

The finding had a cross-cutting aspect in the area of human performance, training, because the licensee failed to provide training and ensure knowledge transfer to maintain a knowledgeable, technically competent work force and instill nuclear safety values. Specifically, the licensee failed to ensure that operators were adequately trained on the use of Procedure EN-OP-104 such that required functionality assessments for degraded and/or non-conforming non-technical specification systems were performed as required
Inspection Report# : 2014003 *(pdf)*

Significance: G Mar 31, 2014
Identified By: Self-Revealing
Item Type: FIN Finding
Failure to Correctly Install Flexible Link Bolted Connection on Phase C of 6.9 kV Bus
Inspectors documented a self-revealing finding for the licensee’s failure to correctly install the flexible link bolted connection on phase C of the 6.9 kV non segregated bus of the Unit 2 auxiliary transformer, which contributed to the explosion of the Unit 2 auxiliary transformer. The licensee documented the issue in Condition Report CR-ANO-2-2013-02242. The licensee aligned startup transformer 3 (preferred offsite power source) to carry the plant loads during normal power operations and restarted the plant on January 10, 2014.

Inspectors concluded that the licensee's failure to correctly install the flexible link bolted connection on phase C of the Unit 2 auxiliary transformer 6.9 kV bus was a performance deficiency. The performance deficiency was more than minor because it was associated with the human performance 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 shutdown as well as power operations. Specifically, the incorrectly installed flexible link bolted connection resulted in a reactor trip. Using Inspection Manual Chapter 0609, Attachment 4, "Initial Characterization of Findings," June 19, 2012, and Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," June 19, 2012, Exhibit 1, "Initiating Events Screening Questions," the inspectors determined that the finding was of very low safety significance (Green) because the finding did not result in a reactor trip and the loss of mitigation equipment relied upon to transition the plant from the onset of a trip to a stable shutdown condition. Specifically, Unit 2 would have tripped without explosion of the auxiliary transformer, and without subsequent loss of power to startup transformer 3, if the differential current relay wire had been correctly landed.

This finding did not have a cross-cutting aspect associated with it because the most significant contributor was not indicative of present performance. Specifically, the flexible links and insulation had been installed in this configuration since at least 1979.

Inspection Report# : 2014002 *(pdf)*

Significance: G Mar 31, 2014
Identified By: Self-Revealing
Item Type: FIN Finding
Failure to Land Signal Wire from Differential Relay Output to Generator Lockout Relay
Inspectors documented a self-revealing finding for the licensee's failure to correctly land the signal wire from the Unit 2 auxiliary transformer differential relay output contacts to the main generator lockout relay, which contributed to the explosion of the Unit 2 auxiliary transformer. The licensee documented the issue in Condition Report CR ANO 2 2013 02242. The licensee aligned startup transformer 3 (preferred offsite power source) to carry the plant loads during normal power operations and restarted the plant on January 10, 2014.

Inspectors concluded that the licensee's failure to correctly land the wire, in accordance with the drawing, in the common circuit for the differential current relays was a performance deficiency. The performance deficiency was more than minor because it was associated with the human performance 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 shutdown as well as power operations. Specifically, the non-landed wire resulted in catastrophic failure of the Unit 2 auxiliary transformer after a fault occurred. Using Inspection Manual Chapter 0609, Attachment 4, "Initial Characterization of Findings," June 19, 2012, and Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," June 19, 2012, Exhibit 1, "Initiating Events Screening Questions," the inspectors determined that the finding was of very low safety significance (Green) because the finding did not result in a reactor trip and the loss of mitigation equipment relied upon to transition the plant from the onset of a trip to a stable shutdown condition. Specifically, a fault would not have originated in phase C of the 6.9 kV bus of the auxiliary transformer if the flexible link had been correctly installed; the non-landed differential current relay wire only served to increase the likelihood of transformer explosion in the event of a fault on the 6.9 kV bus.

This finding did not have a cross-cutting aspect associated with it because the most significant contributor was not indicative of present performance. Specifically, the last time the wire could have been removed was 1995.

Inspection Report# : 2014002 *(pdf)*

Significance: Y Feb 10, 2014
Identified By: NRC
Item Type: VIO Violation
Unit 2 - Failure to Follow the Materials Handling Program during the Unit 1 Generator Stator Move
Unit 2 Apparent Violation. The inspectors reviewed a self-revealing apparent violation of 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures and Drawings," which states, in part, that "activities affecting quality shall be prescribed by documented instructions, procedures, or drawings, of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions, procedures or drawings." The licensee did not follow the requirements specified in Procedure EN-MA-119, "Material Handling Program," in that, the licensee did not perform an adequate review of the subcontractor's lifting rig design calculation and the licensee failed to conduct a load test of the lifting rig prior to use. The licensee initiated Condition Report CR-ANO-C-2013-00888 to capture this issue in the corrective action program. The licensee's corrective actions included repairing damage to the Unit 1 turbine deck, fire main system, and electrical system. In addition, changes were made to various procedures including Procedure EN-DC-114, "Project Management," to provide guidance on review of calculations, quality requirements, and standards associated with third party reviews.

The inspectors determined that this finding was more than minor because it was associated with the procedural control attribute of the initiating event cornerstone, and adversely affected the cornerstone's objective to limit the likelihood of events that upset plant stability and challenge critical safety functions during shutdown, as well as power operations. The stator drop caused a reactor trip on Unit 2 and damage to the fire main system which resulted in water intrusion into the electrical equipment causing a loss of startup transformer 3. This resulted in the loss of power to various loads, including reactor coolant pumps, instrument air compressors, and the safety-related Train B vital electrical bus. The inspectors used Inspection Manual Chapter 0609, Attachment 0609.04, "Initial Characterization of Findings," dated June 19, 2012, and Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," dated June 19, 2012, to evaluate the significance of the finding. Since this was an initiating event, the inspectors used Exhibit 1 of Appendix A and determined that Section C, "Support System Initiators," was impacted because the finding involved the loss of an electrical bus and a loss of instrument air. The inspectors determined that Section E, "External Event Initiators," of Exhibit 1 should also be applied because the finding impacted the frequency of internal flooding. Since Sections C and E were impacted, a detailed risk evaluation was required. The NRC risk analyst used the Arkansas Nuclear One, Unit 2 Standardized Plant Analysis Risk Model, Revision 8.21, and hand calculation methods to quantify the risk. The model was modified to include additional breakers and switching options, and to provide credit for recovery of emergency diesel generators during transient sequences. Additionally, the analyst performed additional runs of the risk model to account for consequential loss of offsite power risks that were not modeled directly under the special initiator. The largest risk contributor (approximately 96 percent) was a loss of all feedwater to the steam generators, with a failure of once-through cooling. The result of the analysis was a conditional core damage probability of 2.8E-5; therefore, this finding was preliminarily determined to have substantial safety significance (Yellow).

This finding had a cross-cutting aspect in the area of human performance associated with field presence, because the licensee did not ensure adequate supervisory and management oversight of work activities, including contractors and supplemental personnel. Specifically, the licensee did not provide a sufficient level of oversight in that, the requirements in Procedure EN-MA-119, for design approval and load testing of the temporary hoisting assembly, were not followed [H.2].

Issued as preliminary Yellow AV in IR 05000313,368/2013012 dated March 24, 2014.

Final significance was determined to be Yellow. NOV issued in IR 05000313,368/2014008 dated June 23, 2014.
Inspection Report# : 2013012 *(pdf)*
Inspection Report# : 2014008 *(pdf)*

Mitigating Systems

Significance: G Dec 31, 2014
Identified By: NRC
Item Type: NCV NonCited Violation
Failure to Develop Adequate Guidance for Extreme Damage Mitigation
The inspectors identified a noncited violation of 10 CFR 50.54(hh)(2) for the failure to develop mitigating strategy guidance that would successfully maintain or restore Unit 2 core cooling after the loss of large areas of the plant. Specifically, the guidance did not ensure the capability of the mitigating strategy because an unisolated flow diversion could have prevented water from reaching the steam generators and cooling the core. The issue was documented in Condition Report CR ANO 2 2014 03277 and the procedure was revised to correct the condition.

The licensee's failure to develop mitigating strategy guidance that would successfully maintain or restore Unit 2 core cooling after loss of large areas of the plant, as required by 10 CFR 50.54(hh)(2), was a performance deficiency. The performance deficiency was 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. Specifically, the guidance did not ensure the capability of the mitigating strategy because an unisolated flow diversion could have prevented water from reaching the steam generators and cooling the core. Using NRC Manual Chapter 0609, Attachment 4, "Initial Characterization of Findings," dated June 19, 2012, and NRC Manual Chapter 0609, Appendix L, "B.5.b Significance Determination Process," dated December 24, 2009, Table 1, "SDP Screening Worksheet for B.5.b," the finding was determined to be of very low safety significance because the performance deficiency represented the unrecoverable unavailability of an individual mitigating strategy; other core cooling mitigating strategies were available. This finding has a human performance crosscutting aspect associated with avoid complacency, in that the licensee failed to recognize and plan for the possibility of latent issues, even while expecting successful outcomes.

Inspection Report# : 2014005 *(pdf)*

Significance: G Dec 31, 2014
Identified By: NRC
Item Type: NCV NonCited Violation
Failure to Maintain Automatic Start of Vital Switchgear Ventilation
Inspectors identified a Green noncited violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," for the licensee's failure to maintain design control of the Unit 2 vital switchgear ventilation system. Specifically, the licensee failed to ensure that the ventilation was capable of cooling the switchgear under design basis conditions when an automatic start of the exhaust fans was inappropriately replaced by manual actions. The issue was documented in Condition Report CR ANO 2-2014-00352 and the licensee instituted compensatory measures for immediate corrective actions.

The licensee failed to ensure that the ventilation was capable of cooling the switchgear under design basis conditions when an automatic start of the exhaust fans was inappropriately replaced by manual actions, which was a performance deficiency. The performance deficiency was more than minor because it was associated with the design control 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 was therefore a finding. Specifically, the licensee replaced automatic action of the Unit 2 vital electrical equipment ventilation with manual action, which was contrary to the licensing basis and did not ensure reliability of the vital electrical equipment. Using Manual Chapter 0609, Attachment 4, "Initial Characterization of

Findings," June 19, 2012, and Appendix A, "The Significance Determination Process (SDP) for Findings at Power," June 19, 2012, Exhibit 2, "Mitigating Systems Screening Questions," the inspectors determined that the finding was of very low safety significance (Green) because the finding was a deficiency affecting the design of a mitigating system, and the system maintained its functionality with the proceduralized manual actions. The inspectors determined that there was no cross-cutting aspect associated with this finding because the cause of the performance deficiency occurred more than three years ago, and was not representative of current licensee performance.

Inspection Report# : 2014005 *(pdf)*

Significance: G Sep 30, 2014
Identified By: Self-Revealing
Item Type: NCV NonCited Violation
Failure to Establish Preventative Maintenance on Unit 2 Main Steam Isolation Valves
Inspectors documented a Green self-revealing non-cited violation of Technical Specification 6.4.1.a for the licensee's failure to establish procedures recommended by Regulatory Guide 1.33, Revision 2, Appendix A, Section 9, February 1978. Specifically, the licensee failed to establish preventative maintenance procedures for valve internal inspection and testing of the Unit 2 main steam isolation valves. On December 23, 2013, the train A main steam isolation valve (2CV-1010-1) was declared Inoperable due to the valve sticking at fifteen percent open on multiple stroke attempts. The licensee's cause evaluation identified that mechanical binding and corrosion of the valve internals were results of a lack of preventive maintenance. The licensee repaired the 2CV-1010-1 valve and performed subsequent testing to demonstrate Operability. The issue was documented in Condition Report CR ANO 2 2013-02502.

The inspectors determined that the failure to establish preventative maintenance procedures for valve internal inspection and testing of the Unit 2 main steam isolation valves was 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. Specifically, the lack of preventative maintenance adversely affected the reliability of the main steam isolation valve 2CV-1010-1 to close within the time assumed in the accident analysis. Using Manual Chapter 0609, Attachment 4, "Initial Characterization of Findings," and Appendix A, "The Significance Determination Process (SDP) for Findings at Power," Exhibit 2, the inspectors determined the finding to be of very low safety significance (Green) because the finding did not represent the loss of a system safety function and did not represent an actual loss of safety function of at least one train for greater than its technical specification allowed outage time.

The finding was determined to have a cross-cutting aspect in the area of problem identification and resolution, in that the licensee failed to thoroughly evaluate issues to ensure that resolutions address causes commensurate with their safety significance. Specifically, during a previous stroke test of the 2CV-1010-1 valve in 2011, the licensee identified that the valve experienced a sluggish or jerky motion and took longer than normal to open. The licensee entered this issue into the corrective action program but did not fully evaluate and troubleshoot the condition adverse to quality to ensure resolution of the cause
Inspection Report# : 2014004 *(pdf)*

Significance: Y Aug 01, 2014
Identified By: NRC
Item Type: VIO Violation
Inadequate Flood Protection for Auxiliary and Emergency Diesel Fuel Storage Buildings
The inspectors identified a finding of preliminary substantial safety significance (Yellow) for the failure to design, construct, and maintain the Units 1 and 2 auxiliary and emergency diesel fuel storage buildings in accordance with the safety analysis reports' description of internal and external flood barriers so that they could protect safety-related

equipment from flooding. Two apparent violations were associated with this finding:

a. Contrary to 10 CFR Part 50, Appendix B, Criterion III, “Design Control,” the licensee failed to assure that regulatory requirements and the design basis were correctly translated into specifications, drawings, procedures, and instructions, and that design changes were subjected to design control measures commensurate with those applied to the original design.

b. Contrary to 10 CFR Part 50, Appendix B, Criterion V, “Instructions, Procedures, and Drawings,” the licensee failed to prescribe documented instructions for activities affecting quality and accomplish activities affecting quality in accordance with drawings.

The licensee entered these issues into the corrective action program as Condition Reports CR-ANO-C-2013-01304 and CR-ANO-C-2014-00259. The licensee resolved the safety concern by replacing the degraded seals or parts, installing penetration seals, implementing compensatory measures, and/or incorporating instructions into procedures.

The inspectors determined that the finding was more than minor because it was associated with the protection against external factors 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. Specifically, the performance deficiency resulted in the vulnerability to flooding of safety-related equipment necessary to maintain core cooling in the auxiliary and emergency diesel fuel storage buildings. The inspectors used Inspection Manual Chapter 0609, Attachment 0609.04, “Initial Characterization of Findings,” dated June 19, 2012, and Appendix A, “The Significance Determination Process (SDP) for Findings At-Power,” dated June 19, 2012, to evaluate the significance of the finding. In accordance with Appendix A, Exhibit 4, the inspectors determined that a detailed risk evaluation was necessary because, if the flood barriers were assumed to be completely failed, two or more trains of a multi-train system would be degraded during an external flood.

The NRC risk analysts determined that the finding should be evaluated in accordance with NRC Inspection Manual Chapter 0609, Appendix M, “Significance Determination Process Using Qualitative Criteria,” April 12, 2012. Appropriate quantitative significance determination process tools did not exist to provide a reasonable estimate of the significance because a plant-specific flood hazard analysis did not exist and was not expected to be available until sometime in 2015. The risk analysts used NRC Inspection Manual Chapter 0609, Appendix M, Table 4.1, “Qualitative Decision-Making Attributes for NRC Management Review,” to determine the preliminary safety significance of the finding. The following were the dominant considerations in reaching a preliminary risk determination conclusion:

1. With respect to the auxiliary and emergency diesel fuel storage buildings, there were more than 100 unknown ingress pathways for a flooding event, therefore if an external flood above grade level were to occur, the buildings would flood.

2. The unexpected rate of flooding would likely be beyond the licensee’s capability to prevent or mitigate as equipment and connections associated with alternative mitigating strategies, could be submerged.

3. All reactor core cooling and makeup could fail due to significant flooding of the auxiliary and emergency diesel fuel storage buildings.

4. The change in core damage frequency was quantitatively bounded below 2 x 10-3 and qualitatively determined to likely be less than 1 x 10-4. The bounding and qualitative results are based on the frequency of the probable maximum flood event and a loss of all equipment needed for core cooling and makeup.

This finding was preliminarily determined to be of substantial safety significance (Yellow) for Unit 1 and Unit 2, as determined by a Significance and Enforcement Review Panel.

This finding had a cross-cutting aspect in the area of human performance related to maintaining design margins. Specifically, the licensee did not design, construct, and/or maintain over 100 flood barriers to ensure design margins were sustained.

The finding was determined to be Yellow (substantial safety significance) for both Units. Final significance determination and NOV issued January 22, 2015 (IR 05000313;638/2014010) (ML15023A076).
Inspection Report# : 2014009 *(pdf)*
Inspection Report# : 2014010 *(pdf)*

Significance: G Mar 31, 2014
Identified By: Self-Revealing
Item Type: NCV NonCited Violation
Failure to Maintain Alternate ac Diesel Generator Governor
The inspectors documented a self-revealing non-cited violation of 10 CFR 50.63, "Loss of all alternating current power," for the licensee's failure to maintain the alternate ac diesel generator so that a power source would be available to withstand and recover from a station blackout. Specifically, the licensee failed to perform adequate preventive maintenance on the governor of the diesel in accordance with the recommended vendor maintenance, which resulted in an overspeed trip of the engine during testing. The licensee repaired the governor and documented the issue in Condition Report CR-ANO-C-2013-00331.

The inspectors determined that the failure to perform adequate preventive maintenance on the governor of the alternate ac diesel generator in accordance with the recommended vendor maintenance was a performance deficiency. This 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 was therefore a finding. Specifically, the reliability of the alternate ac diesel generator was adversely affected by the lack of governor maintenance so that the diesel was unavailable to respond to a postulated station blackout. Using Manual Chapter 0609, Attachment 4, "Initial Characterization of Findings," June 19, 2012, and Appendix A, "The Significance Determination Process (SDP) for Findings at Power," June 19, 2012, Exhibit 2, "Mitigating System Screening Questions," the inspectors determined that the finding required a detailed risk evaluation because it was an actual loss of function of a non-technical specification train of equipment designated as high safety-significant in accordance with the licensee's maintenance rule program for greater than 24 hours. The Region IV senior reactor analyst performed a detailed risk evaluation in accordance with Appendix A, Section 6.0, "Detailed Risk Evaluation." The risk was dominated by internal loss of offsite power initiators and fire-induced loss of offsite power scenarios. The calculated change in core damage frequency was 8.9 x 10-7 for Unit 1 and 5.6 x 10-7 for Unit 2. The analyst also determined that the finding would not involve a significant increase in the risk of a large, early release of radiation. This finding has been determined to be of very low safety significance (Green).

Although the
performance deficiency initially occurred over three years ago, the licensee documented in Condition Report CR-ANO-C-2014-00166 that the alternate ac diesel generator was not maintained commensurate with its risk significance and that a contributing cause was that management had not implemented a comprehensive maintenance strategy in accordance with the risk significance of the diesel. Therefore, inspectors concluded that the cause of the performance deficiency was reflective of present performance. Specifically, the licensee failed to implement a comprehensive preventative maintenance strategy on the alternate ac diesel generator governor commensurate with its risk significance [H.13]

Inspection Report# : 2014002 *(pdf)*

Significance: G Feb 10, 2014
Identified By: Self-Revealing
Item Type: NCV NonCited Violation
Failure to Adequately Develop and Implement Adequate Procedural Controls to Remediate the Anticipated Effects of Internal Flooding for Either Unit
The inspectors reviewed a self-revealing, non-cited violation of Unit 1 Technical Specification 5.4.1.a and Unit 2 Technical Specification 6.4.1.a, involving the licensee's failure to develop and implement procedural controls for response to internal flooding. Specifically, the licensee did not incorporate any instructions for the operation of the permanently installed temporary fire pump into procedures, which resulted in flooding due to the ruptured fire main header and not securing the temporary fire pump for approximately 50 minutes. The licensee's corrective actions included changing Checklist 1104.032, "Fire Protection Systems," Revision 76, to include guidance for securing the temporary fire pump in the event of a leak or rupture in the fire main header and provided personnel training on this change. This issue was entered into the corrective action program as Condition Reports CR-ANO-C-2013-01072 and CR ANO-C-2013-01962.

The inspectors determined that the licensee's failure to develop and implement adequate procedural controls for the permanently installed temporary fire pump was a performance deficiency. The performance deficiency was more than minor because it was associated with the procedural quality attribute of the mitigating systems cornerstone and affected the cornerstone's objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e. core damage). Specifically, if the necessary flood prevention/mitigation actions cannot be completed in the time required, much of the station's accident mitigation equipment could be adversely impacted.

Unit 1 Analysis:
Inspection Manual Chapter 0609, Attachment 0609.04, "Initial Characterization of Findings," dated June 19, 2012, Table 3, Section A, directs the user to Appendix G. The inspectors used Inspection Manual Chapter 0609, Appendix G, Attachment 1, "Shutdown Operations Significance Determination Process Phase 1 Operational Checklists for Both PWRs and BWRs," dated May 25, 2004, Checklist 4, to evaluate the significance of the finding. The inspectors determined that the finding was of very low safety significance (Green) because the finding did not: (1) increase the likelihood of a loss of reactor coolant system inventory, (2) degrade the licensee's ability to terminate a leak path or add reactor coolant system inventory when needed, or (3) degrade the licensee's ability to recover decay heat removal once it is lost.

Unit 2 Analysis:
Inspection Manual Chapter 0609, Attachment 0609.04, "Initial Characterization of Findings," dated June 19, 2012, Table 3, Section E, Step 2, directs the user to Appendix F, "Fire, Protection Significance Determination Process," dated September 20, 2013. The inspectors used Appendix F, to evaluate the significance of the finding. The finding involved a fixed fire protection system and the fire water supply (temporary fire pump). The finding was screened against the qualitative screening question in Appendix F, Task 1.3.1 and the inspectors determined it was of very low safety significance (Green), because the reactor was able to reach and maintain safe shutdown.
The finding had a cross-cutting aspect in area of the human performance associated with documentation, because the licensee failed to create and maintain complete, accurate, and up-to-date documentation for the use of the temporary fire pump

Inspection Report# : 2013012 *(pdf)*

Significance: G Feb 10, 2014
Identified By: Self-Revealing
Item Type: FIN Finding

Main Feedwater Regulating Valve Maintenance Practices
The inspectors reviewed a self-revealing finding for the licensee's failure to provide appropriate work instructions for the replacement of the main feedwater regulating valve 2CV-0748 linear variable differential transformer 2ZT-0748. Specifically, the licensee failed to translate vendor recommendations for use of a thread sealant, and torqueing of the adjustment nuts on the linear variable differential transformer 2ZT-0748 into procedural steps to be accomplished and verified. The failure to follow these recommendations resulted in the nuts falling off because of vibration. The licensee initiated Condition Report CR-ANO-2-2013-00423 and Work Order WT-WTANO-2013-00039 to update the work instructions and perform maintenance to repair the valve position indication by adding thread sealant and torqueing the adjustment nuts to prevent them from loosening.

The inspectors determined that the failure to provide instructions to properly perform maintenance on linear variable differential transformer 2ZT-0748 was a performance deficiency. The performance deficiency was more than minor because it was associated with the procedure quality attribute of the mitigating systems cornerstone. It 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. The inspectors used Inspection Manual Chapter 0609, Attachment 0609.04, "Initial Characterization of Findings," dated June 19, 2012, and Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," dated June 19, 2012, to evaluate the significance of the finding. The inspectors determined the finding was of very low safety significance (Green) because the finding did not: (1) result in an actual loss of operability or 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) involve the loss or degradation of equipment or function specifically designed to mitigate a seismic, flooding, or severe weather event. The finding had a cross-cutting aspect in the area of the problem identification and resolution associated with operating experience, because although the licensee had collected and evaluated the operating experience, it was not implemented as procedural steps in linear variable differential transformer replacement work instructions

Inspection Report# : 2013012 *(pdf)*

Barrier Integrity

Emergency Preparedness

Significance: G Dec 31, 2014
Identified By: NRC
Item Type: NCV NonCited Violation
Failure to Correct Weaknesses During an Evaluated Exercise
The inspectors identified a non-cited violation of 10 CFR Part 50.47(b)(14) for the failure to correct a deficiency identified in a 2013 simulator drill. Specifically, control room operators did not implement the procedure that describes how the site will maintain continuous communication with threat notification sources during a drill conducted August 7, 2013, and also during the September 16, 2014, biennial exercise. The inspectors determined that the licensee's corrective actions for this issue were incomplete and did not address the extent of condition.

The failure to correct weaknesses occurring in drills and exercises is a performance deficiency within the licensee's ability to foresee and correct. The performance deficiency is more than minor because it is associated with the

emergency response organization performance attribute of the Emergency Preparedness cornerstone and it adversely impacted the cornerstone objective. The licensee's ability to implement adequate measures to protect the health and safety of the public in the event of hostile action and a radiological emergency is degraded when it fails to correct performance that precludes the effective implementation of the emergency plan. This finding was evaluated using Manual Chapter 0609, Appendix B, "Emergency Preparedness Significance Determination Process (SDP)," Attachment 2, dated February 24, 2012, and was determined to be of very low safety significance (Green) because it was a failure to comply with NRC requirements, was not associated with a risk-significant planning standard, and was not a loss of planning standard function. The finding was not a loss of function because the deficiency that was identified was not associated with classification, notifications to state and local agencies, or the development of protective action recommendations. The licensee has entered the issue into the corrective action program in corrective action documents WT-WTANO-2014-00189 and Condition Report CR-ANO-C-2014-02478.

The finding was assigned a cross-cutting aspect in the area of problem identification and resolution, associated with the resolution of issues because the licensee failed to evaluate the initial performance issues to ensure that resolutions adequately addressed the extent of condition commensurate with their safety significance. The licensee failed to recognize in August 2013 that continuous communications with threat notification sources is required by regulation and that performance issues with the implementing procedure should be communicated to the entire control room staff population

Inspection Report# : 2014005 *(pdf)*

Occupational Radiation Safety

Public Radiation Safety

Significance: G Jun 29, 2014
Identified By: NRC
Item Type: NCV NonCited Violation
Failure to Establish, Implement, and Maintain Appropriate Changes to the Offsite Dose Calculation Manual For Airborne Sampling
The inspectors identified two examples of a non-cited violation of Unit 1, Technical Specification 5.5.1, "Offsite Dose Calculation Manual (ODCM)," and Unit 2, Technical Specification 6.5.1, "Offsite Dose Calculation Manual." When changes were made to the Offsite Dose Calculation Manual in 1999, the licensee failed to (1) perform analyses or evaluations to justify changes to airborne radionuclide and/or particulate sampling requirements related to particulate air sampling collection frequency and (2) establish an airborne sampling location for a community in the highest deposition factor wind sector for the site. As immediate corrective actions, the licensee evaluated their offsite dose calculation manual and developed a plan to meet the environmental sampling requirements. The issue was documented in Condition Report CR-ANO-C-2014-01380.

The failure to follow the requirements of Unit 1 Technical Specification 5.5.1 and Unit 2 Technical Specification 6.5.1 was a performance deficiency. The performance deficiency was more than minor because it adversely affected the cornerstone objective to ensure adequate protection of public health and safety from exposure to radioactive materials released into the environment and public domain. Specifically, the failure to maintain the Offsite Dose Calculation Manual with appropriate airborne radionuclide sampling requirements adversely impacts the licensee's ability to validate offsite radiation dose assessments for members of the public under certain effluent release

conditions. Using Inspection Manual Chapter 0609, Appendix D, dated February 12, 2008, “Public Radiation Safety Significance Determination Process,” the inspectors determined that the violation has very low safety significance because it involves the environmental monitoring program. The finding had a cross-cutting aspect in the area of human performance, associated with procedure adherence, because licensee personnel failed to follow procedures when they established the sampling frequency and locations for the updated Radiological Environmental Monitoring Program
Inspection Report# : 2014003 *(pdf)*

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

Last modified : February 26, 2015