Arkansas Nuclear 1
3Q/2015 Plant Inspection Findings

Initiating Events

Significance: G Jun 30, 2015
Identified By: NRC
Item Type: NCV Non-Cited Violation
Inadequate Procedure for Severe Weather Preparation
The inspectors identified a non-cited violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, & Drawings," for the failure to establish appropriate procedures for preparations for severe weather. Specifically, inspectors observed that the licensee failed to ensure that all outside areas were inspected in order to secure material prior to severe weather, to reduce the probability of light material missile damage on plant equipment. The licensee concluded that the assignment of responsibilities was unclear in Procedure EN-FAP-EP-010, "Severe Weather Response," Revision 1, leading to confusion among the two operating crews. This issue was entered into the licensee's corrective action program as Condition Reports CR-ANO-C-2015-00854 and CR-ANO-C-2015-00859.

The failure to have a procedure to ensure that all outside areas would be inspected in order to secure loose material prior to the arrival of severe weather, to reduce the probability of light material missile damage on plant equipment was a performance deficiency. The performance deficiency was more than minor because it was associated with the procedure quality 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, during severe weather, unsecured material could become a missile that impacts equipment and upsets plant stability. Using NRC Inspection Manual Chapter 0609, Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," the inspectors determined that the finding had very low safety significance (Green) because it did not represent an actual reactor trip and the loss of mitigation equipment. This finding has a human performance crosscutting aspect associated with work management, in that the organization failed to implement a process of planning, controlling, and executing work activities, including coordination with different groups or job activities. Specifically, only one crew performed the required inspections when severe weather had been forecast since the procedure in use did not clearly assign responsibilities to both operating crews [H.5].

Inspection Report# : 2015002 *(pdf)*

Significance: Y Feb 10, 2014
Identified By: NRC
Item Type: VIO Violation
Unit 1 - Failure to Follow the Materials Handling Program during the Unit 1 Generator Stator Move
Unit 1 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 the 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 affected offsite power to Unit 1, resulting in a loss of offsite power for approximately 6 days and a loss of the alternate AC diesel generator. The inspectors used Inspection Manual Chapter 0609, Attachment 0609.04, “Initial Characterization of Findings,” dated June 19, 2012, to evaluate the significance of the finding. Since the plant was shutdown, the inspectors were directed to Inspection Manual Chapter 0609, Appendix G, Attachment 1, “Shutdown Operations Significance Determination Process Phase 1 Operational Checklists for Both PWRs and BWRs,” Checklist 4, dated May 25, 2004. Using Appendix G, Attachment 1, Checklist 4, the inspectors concluded that this finding represented a degradation of the licensee’s ability to add reactor coolant system inventory when needed since a loss of offsite power occurred and therefore, this finding required a Phase 3 analysis. A shutdown risk model was developed by modifying the at-power Arkansas Nuclear One Unit 1 Standardized Plant Analysis Risk Model, Revision 8.19. The NRC risk analyst assessed the significance of shutdown events by calculating an instantaneous conditional core damage probability. The results were dominated by two sequences. The largest risk contributor (approximately 97 percent) was based on a failure of the emergency diesel generators without recovery. The second largest risk contributor was the failure to recover decay heat removal. The result of the analysis was an instantaneous conditional core damage probability of 3.8E-4; therefore, this finding was preliminarily determined to have high safety significance (Red).

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 Red 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 Sep 30, 2015
Identified By: Self-Revealing
Item Type: NCV Non-Cited Violation
Failure to Promptly Correct a Condition Adverse to Quality Involving Motor Control Center Bus Stabs
Green. The inspectors reviewed a self-revealing violation of 10 CFR Part 50, Appendix B, Criterion XVI, “Corrective Action,” for the failure to correct conditions adverse to quality. Specifically, the licensee failed to promptly replace short bus stabs with longer bus stabs in six 480V safety-related motor control centers as planned following a 2007 motor control center fault. Subsequently, safety-related motor control centers remained susceptible to a fault because corrective actions had not been implemented. This issue was entered into the licensee’s corrective action program as Condition Report 2015-2661. The licensee has completed the modifications to all breakers except those requiring an

outage.

The failure to promptly correct conditions adverse to quality associated with 480V breaker connections to bus bars was a performance deficiency. The performance deficiency is more than minor because it is associated with the equipment performance attribute of Mitigating Systems Cornerstone and adversely affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events. Specifically, untimely corrective actions allowed an increased likelihood of a fault to continue to exist that would result in the loss of the associated safety-related motor control centers if the fault occurred. Using NRC Inspection Manual Chapter 0609 Appendix A, "Significance Determination Process (SDP) for Findings At-Power," the inspectors determined that the finding was of very low safety significance (Green) because the finding was not a deficiency affecting design or qualification, did not represent a loss of system and/or function, and did not represent an actual loss of function. This finding was not assigned a cross-cutting aspect because it was not indicative of current plant performance; the licensee decided to remove the corrective actions from the corrective action program more than 3 years ago.
Inspection Report# : 2015003 *(pdf)*

Significance: G Jun 30, 2015
Identified By: NRC
Item Type: NCV Non-Cited Violation
Failure to Perform Testing of Diesel Fuel Oil Transfer Piping
The inspectors identified a non-cited violation of 10 CFR Part 50, Appendix B, Criterion XI, "Test Control," for the licensee's failure to establish and maintain an adequate testing program for the fuel oil transfer piping for Units 1 and 2. Specifically, the licensee did not establish inservice testing to detect degradation of the fuel oil piping between the fuel oil storage tanks and the emergency diesel generator day tanks. This issue was entered into the licensee's corrective action program as Condition Report CR-ANO-2-2015-01092.

The failure to perform the required testing of the fuel oil piping is a performance deficiency. The performance deficiency is more than minor because it is associated with the protection against external factors attribute of the Mitigating Systems Cornerstone, and affects the cornerstone objective to ensure availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequence. Specifically, the licensee failed to perform examinations required to provide reasonable assurance that the piping could perform its intended function during design basis seismic events, and therefore maintain the ability to supply fuel to the emergency diesel generators. Using NRC Inspection Manual Chapter 0609, Appendix A, Exhibit 2, "Mitigating Systems," the inspectors determined the finding is of very low safety significance (Green) because the finding did not involve the loss or degradation of equipment or function specifically designed to mitigate a seismic initiating event. The finding has a cross-cutting aspect in the area of human performance, associated with conservative bias, because the licensee did not use decision-making practices that emphasized prudent choices over those that were simply allowable. Specifically, during the buried piping initiative inspections that were completed in August 2013, the licensee failed to identify that the condition of the safety-related piping had never been evaluated and was being treated as a run to failure component [H.14].

Inspection Report# : 2015002 *(pdf)*

Significance: G Dec 31, 2014
Identified By: NRC
Item Type: NCV Non-Cited Violation
Failure to Provide Flow Protection for Auxiliary Feedwater Pump in Emergency Operating Procedures
Inspectors identified a noncited violation of Unit 1 Technical Specification 5.4, "Procedures," for the licensee's failure to establish adequate emergency operating procedures. Specifically, the licensee's emergency operating procedures provide minimum flow protection for the Unit 1 auxiliary feedwater pump, which could result in catastrophic failure

of the pump. The issue was documented in Condition Report CR ANO 1 2014 00286 and the procedures were revised to correct the condition.

The failure to provide minimum flow protection for the Unit 1 auxiliary feedwater pump in emergency and abnormal operating procedures in accordance with the emergency operating procedure writer's guide 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 that respond to initiating events to prevent undesirable consequences, and was therefore a finding. Specifically, inadequate emergency and abnormal operating procedures could have resulted in failure of the auxiliary feedwater pump, a mitigating system for a loss of main and emergency feedwater. 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 required a detailed risk evaluation because the finding represented a loss of system. A Region IV senior reactor analyst performed the detailed risk evaluation and determined that the change to the core damage frequency was less than 4E-7/year (Green). The dominant core damage sequences included losses of one of the safety related 4160 volt electrical buses, steam generator tube ruptures, and plant transients. The equipment that helped mitigate the risk included the high pressure injection system (for feed and bleed) and the main and emergency feedwater systems.

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 emergency and abnormal operating procedures for operating auxiliary feedwater had not changed for at least 20 years.

Inspection Report# : 2014005 *(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# : 2014010 *(pdf)*
Inspection Report# : 2014009 *(pdf)*

Barrier Integrity

Emergency Preparedness

Significance: G Dec 31, 2014
Identified By: NRC
Item Type: NCV Non-Cited Violation
Failure to Correct Weaknesses During Drills and Exercises
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

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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