Sequoyah 1
1Q/2010 Plant Inspection Findings

Initiating Events

Significance: G Dec 31, 2009
Identified By: Self-Revealing
Item Type: FIN Finding
Reactor Trip due to Inadequate Transformer Bus Duct Maintenance Procedure
A self-revealing finding was identified for an inadequate maintenance procedure which was used to perform a periodic maintenance activity to clean and inspect the bus duct associated with the 'D' common station service transformer (CSST). This resulted in the bus duct being left in a condition that allowed for water intrusion to occur, which led to a fault that caused a loss of one offsite power supply and an automatic reactor trip of both units with main feedwater unavailability. The licensee entered this issue into the corrective action program (CAP) as PER 166884.

The finding was determined to be greater than minor because it was associated with the procedure quality attribute of the initiating events cornerstone and affected the cornerstone objective to limit the likelihood of those events that upset plant stability and challenge critical safety functions. Specifically, the use of an inadequate procedure directly contributed to the loss of one offsite power supply and an automatic reactor trip of both units with main feedwater unavailability. Using Inspection IMC 0609, "Significance Determination Process," Attachment 4, "Phase 1 - Initial Screening and Characterization of Findings," the finding was determined to be applicable to a Phase 2 analysis since the finding contributed to both the likelihood of a reactor trip and the likelihood that mitigating systems will not be available. Using IMC 0609 Appendix A, "Determining the Significance of Reactor Inspection Findings for At-Power Situations," a Phase 2 analysis was performed
using the site specific risk-informed inspection notebook. The finding was assumed to affect the initiating event likelihood (IEL) of a Transient With Loss of Power Conversion System (TPCS), since power availability to the unit boards affects reactor coolant pump function as well as main condenser availability. A regional Senior Reactor Analyst performed a Phase 3 Significance Determination Process evaluation. The evaluation concluded the finding was of very low safety significance (Green) based on an assumed unavailability of the CSST 'B' fast transfer function of 0.11/yr. No cross-cutting aspect was identified since the issue was not reflective of
current licensee performance, in that the inadequate maintenance procedure was implemented in December 2006
Inspection Report# : 2009005 *(pdf)*

Significance: G Sep 30, 2009
Identified By: Self-Revealing
Item Type: FIN Finding
Feedwater regulating valve failure due to inadequate maintenance procedure
A self-revealing finding was identified for an inadequate maintenance procedure which was used to perform a rebuild of the Unit 1, Loop 1, main feedwater regulating valve (FRV) actuator. The failure to specify an applicable torque requirement associated with the installation of the control air diaphragm resulted in a failure of the diaphragm and a reactor trip due to a loss of main feedwater to the Loop 1 steam generator. The event was reported to the NRC as event notification (EN) 45045 and documented in the licensee corrective action program as PER 170598.

The finding was determined to be greater than minor because it was associated with the procedure quality attribute of the initiating events cornerstone and affected the cornerstone objective to limit the likelihood of those events that upset plant stability, in that the FRV actuator failure caused a reactor trip and loss of main feedwater to the Loop 1 steam generator. Using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process," Attachment 4, "Phase 1 - Initial Screening and Characterization of Findings," the finding was determined to have very low safety significance (Green) because it did not contribute to both the likelihood of a reactor trip and the likelihood that mitigating systems will not be available. The cause of this finding was determined to have a cross-cutting aspect in the area of human performance associated with the resources component. It was directly related to the availability of

resources necessary for complete accurate and up-to-date work packages. [H.2(c)] Specifically, the licensee's vendor manual for the affected component was not maintained up-to-date to contain the most current information and requirements from the vendor applicable to the maintenance activities conducted (Section 4OA3.2).

Inspection Report# : 2009004 *(pdf)*

Significance: G Sep 30, 2009
Identified By: NRC
Item Type: NCV NonCited Violation
Failure to perform a 10 CFR 50.59 evaluation for abnormal operating procedure M.09, "loss of charging".
The inspectors identified a Severity Level IV NCV of 10 CFR 50.59 for the licensee's failure to perform a 10 CFR 50.59 evaluation for a new station Abnormal Operating Procedure (AOP) - M.09, "Loss of Charging," Rev. 0, that included a preplanned, proceduralized 10 CFR 50.54(x) action that was a deviation from the Technical Specifications (TS). The licensee entered this issue into their corrective action program as PER 158739, and completed the corrective actions to remove the NRC unapproved operator actions from the procedure.
This finding was assessed using traditional enforcement. The finding was more than minor because the change requiring 10 CFR 50.59 evaluation would have required NRC review and approval prior to implementation. A regional senior risk analyst performed a Phase 3 Significance Determination and characterized the performance deficiency as very low safety significance (Green) based on risk. The inspectors concluded that the finding reflected current licensee performance and involved the cross-cutting aspect of non-conservative assumptions of the decision-making component of the cross-cutting area of Human Performance [H.1(b)]. (Section 4OA5.2)

Inspection Report# : 2009004 *(pdf)*

Significance: G Jun 30, 2009
Identified By: NRC
Item Type: NCV NonCited Violation
Reactor trip due to inadequate plant operating procedures
On April 28, 2009, with Unit 1 operating at approximately 27 percent RTP during startup from a refueling outage, a moisture separator reheater (MSR) shell side relief valve lifted. Operators responded by reducing power to approximately 18 percent RTP in accordance with plant procedures. With the affected relief valve still open, operators tripped the turbine in accordance with plant procedures. Approximately 10 minutes after the turbine trip occurred, two of the three parallel "strings" of intermediate pressure feedwater heaters had automatically isolated due to high level on the shell side of the #2 heaters in each string, with the third string isolation imminent for the same reason. Operators responded in accordance with plant procedures by manually tripping the reactor due to imminent loss of condensate supply to the main feedwater pumps, and, thus, main feedwater supply to the steam generators.

The inspectors reviewed the UFSAR and noted that following a turbine trip from an initial power level below 50 percent, the reactor will not be tripped, but instead the reactor plant is designed to be maintained in a stable and controlled manner by plant systems.

This event was entered into the licensee's corrective action program as PERs 169863 and 169976. The licensee evaluation determined that the heater string isolations occurred due to an elevation difference between the #2 heaters and the #3 heater drain tank (HDT), combined with the lack of residual extraction steam pressure (to overcome the elevation difference) following a turbine trip from low power. This configuration resulted in the inventory in the #3 HDT gravity draining back to fill the #2 heaters, which caused the heater string isolations to occur when heater shell side levels reached their respective high level setpoints. This susceptibility was identified by the licensee in 1998 following a similar event.

A nominal operating level in the #3 HDT must be established prior to placing the #3 HDT pump(s) in service, which is required for power operation above approximately 80 percent RTP, as noted in the UFSAR section 10.4.9.3: "With all drains from the No. 3 heater drain tank being bypassed to the condenser (and being passed through the hotwell, demineralized condensate, and condensate booster pumps) the Condensate-Feedwater System can deliver approximately 82 percent (Unit 2) and 81.6 percent (Unit 1) guaranteed flow to the steam generators."

Licensee procedure 0-GO-5, “Normal Power Operation,” Revision 60, which was in effect at the time of the event, directed operators to establish level in the #3 HDT when increasing power from 30 percent power. Approximately two weeks later, the inspectors noted that licensee Procedure 0-GO-4, “Power Ascension From Less Than 5% Reactor Power to 30% Reactor Power,” Revision 59, which was also in effect at the time of the event, contained similar requirements regarding the operation of #3 HDT.

Three days after the event took place, as an interim corrective action, the licensee revised Procedure 0-GO-5 to require that the #3 HDT remain drained and bypassed to the condenser until power exceeds ~45-50 percent power. The licensee had identified this, as well, as the similar deficiency in Procedure 0-GO-4, and revised Procedure 0-GO-4 on May 14, 2009, to also require that the #3 HDT remain drained and bypassed to the condenser until power exceeds ~45-50 percent power.

Since plant systems are designed to prevent a reactor trip following a turbine trip from less than 50 percent power, the inspectors concluded that the operating procedures in effect at the time of the event were inadequate. This was reasonably within the licensee’s ability to foresee and correct, and should have been prevented, since the issue was identified following a similar event in 1998. However, corrective actions to eliminate this susceptibility by controlling, via operating procedures, the power level at which the #3 HDT would be placed in service were not taken at that time.

Inspection Report# : 2009003 *(pdf)*

Mitigating Systems

Significance: G Sep 30, 2009
Identified By: Self-Revealing
Item Type: NCV NonCited Violation
Failure to follow emergency diesel generator operating procedure
A self-revealing non-cited violation (NCV) of 10 CFR 50 Appendix B, Criterion V, Instructions, Procedures, and Drawings, was identified for the licensee’s failure to follow plant procedures for performing independent verifications of procedural steps. Emergency Diesel Generator (EDG) 1B-B was declared operable when it was unable to perform its required safety function due to 11 of 32 cylinder test plugs not being positioned as required following pre-start rolling, which subsequently resulted in EDG damage during testing. This issue was entered into the licensee’s corrective action program as Problem Evaluation Report (PER) 201282. The licensee performed corrective maintenance and returned the emergency diesel generator to service.

The finding was determined to be greater than minor because it was associated with the configuration control attribute of the mitigating system cornerstone and affected the cornerstone objective to ensure the availability of systems that respond to initiating events to prevent undesirable consequences, in that operator error and damage to the 1B-B EDG rendered the EDG unavailable to perform its safety function. Using Inspection Manual Chapter (IMC) 0609, “Significance Determination Process,” Attachment 4, “Phase 1 - Initial Screening and Characterization of Findings,” the finding was determined to have very low safety significance (Green) because the it did not represent a loss of safety function, a loss of single train of safety equipment for greater than the TS allowed outage time, a loss of significant maintenance rule equipment for greater than 24 hours, or screen as potentially risk-significant due to a seismic, flooding, or severe weather initiating event. The cause of this finding was determined to have a cross-cutting aspect in the area of human performance associated with the resources component. It was directly related to the training of personnel [H.2(b)]. Specifically, the operator that performed the independent verification of the vent valves positions did not receive training on the operation of the new design of EDG cylinder vent valves. (Section 1R15).

Inspection Report# : 2009004 *(pdf)*

Barrier Integrity

Significance: G Jul 31, 2009
Identified By: NRC
Item Type: NCV NonCited Violation
Failure to Promptly Correct a Condition Adverse to Quality Associated with Out-of-Train Maintenance Controls
Green. The NRC identified a Green non-cited violation of 10 CFR 50, Appendix B, Criterion XVI, Corrective Action, for the licensee's failure to promptly correct a condition adverse to quality by failing to implement corrective actions to address deficient out-of-train maintenance controls during opposite train work weeks. This contributed to entry into a short term shutdown action statement and a Notice of Enforcement Discretion (NOED). The failure to implement corrective action to
provide guidance for controlling out-of-train maintenance was entered into the licensee's corrective action program as PER 177665.

This finding was determined to be greater than minor because it was associated with the Barrier Integrity Cornerstone attribute of barrier performance, and on September 25, 2008, adversely affected the cornerstone objective to provide reasonable assurance that physical design barriers such as the control room protect plant operators and plant controls. The finding was evaluated using Phase 1 of the At-Power Significance Determination Process, and was determined to be of very low safety significance (Green) because the finding only represented a degradation of the radiological barrier function provided for the control room. The finding was assigned a cross-cutting aspect in the corrective action program component of the problem identification and resolution area because, although the licensee had identified deficient controls for out-of-train maintenance, corrective actions were not taken to address the issue in an adequate and timely manner, commensurate with safety significance and complexity. (P.1(d)). (Section 4OA2.a.(3))

Inspection Report# : 2009006 *(pdf)*

Emergency Preparedness

Occupational Radiation Safety

Significance: G Dec 31, 2009
Identified By: NRC
Item Type: NCV NonCited Violation
Failure to Evaluate Mission Dose for Manual Operator Actions Required by Plant Procedures
The inspectors identified a non-cited violation (NCV) of Units 1 and 2 Technical Specification 6.8, "Procedures & Programs," for the licensee's failure to follow procedures involving the review and approval of revisions to a plant abnormal operating procedure (AOP). The incorporation of manual operator actions regarding closure of the containment equipment hatch in the event of a fuel handling accident into a plant AOP without performing a mission dose evaluation resulted in the likelihood that personnel involved with the activity would receive a dose in excess of regulatory limits for occupational exposure. The licensee entered this issue into their corrective action program as PERs 167420 and 167428.

The finding was determined to be greater than minor because it was associated with the program and process attribute of the occupational radiation safety cornerstone and 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. The cornerstone objective was affected since adequate worker protection from exposure to radiation was not ensured through the AOP revision process. Using Inspection IMC 0609, "Significance Determination Process," Attachment 4, "Phase 1 - Initial Screening and Characterization of Findings," and Appendix C, "Occupational Radiation Safety Significance Determination Process," the finding was determined to be of very low safety significance (Green) because it did not affect the licensee's ability to assess dose, did not involve an overexposure or substantial potential for overexposure, and was not related to ALARA planning. No cross-cutting

aspect was identified since the issue was not reflective of current licensee performance, in that the performance deficiency occurred in 2004
Inspection Report# : 2009005 *(pdf)*

Public Radiation Safety

Physical Protection

Although the NRC is actively overseeing the Security cornerstone, the Commission has decided that certain findings pertaining to security cornerstone will not be publicly available to ensure that potentially useful information is not provided to a possible adversary. Therefore, the cover letters to security inspection reports may be viewed.

Miscellaneous

Significance: N/A Jul 31, 2009
Identified By: NRC
Item Type: FIN Finding
Seqouyah PI&R Summary
The team concluded that, in general, problems were properly identified, evaluated, prioritized, and corrected. Generally, the threshold for initiating problem evaluation reports (PERs) was appropriately low, as evidenced by the types of problems identified and the large number of PERs entered annually into the Corrective Action Program (CAP). Employees were encouraged by management to initiate PERs. However, several examples of minor problems were identified by the team, including equipment issues that were not entered into the corrective action program and corrective action item closures that did not implement the actions required to be performed.

The team determined that, overall, audits and self-assessments were adequate in identifying deficiencies and areas for improvement in the CAP, and appropriate corrective actions were developed to address the issues identified. Operating experience usage was found to be generally acceptable and integrated into the licensee's processes for performing and managing work and plant operations.

Based on discussions and interviews conducted with plant employees from various departments, the inspectors determined that personnel at the site felt free to raise safety concerns to management and use the CAP to resolve those concerns.

Inspection Report# : 2009006 *(pdf)*

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