Browns Ferry 1
3Q/2009 Plant Inspection Findings

Initiating Events

Significance: G Jun 30, 2009
Identified By: NRC
Item Type: FIN Finding
Untimely actions to resolve excessive IBC system condensation results in U1 reactor scram
A Green self-revealing finding was identified for a failure to implement corrective actions in a timely manner to address excessive isophase bus cooling system condensation that resulted in a Unit 1 reactor scram caused by water accumulation in the isophase bus ductwork, which created an electrical ground fault on the main generator isophase busses. This event was entered into the licensee's corrective action program as PER 163815.

This finding was determined to be greater than minor because it was associated with the Initiating Event Cornerstone attribute of Equipment Performance, and adversely affected the cornerstone objective to limit the likelihood of those events that upset plant stability and challenge critical safety functions during at power operations. The finding was evaluated using Phase 1 of the At-Power SDP, and was determined to be of very low safety significance (Green) because it did not contribute to both the likelihood of a reactor trip and the likelihood that mitigating equipment or functions were not available. The cause of this finding was directly related to the cross-cutting aspect of appropriate and timely corrective actions in the area of Problem Identification and Resolution because the license had identified an abnormal equipment condition related to excessive IBC system condensation for which immediate actions were specified but not carried out (P.1.d). (Section 4OA3.2)

Inspection Report# : 2009003 *(pdf)*

Significance: G Oct 28, 2008
Identified By: Self-Revealing
Item Type: NCV NonCited Violation
Unit 1 RPV Flange Leak Due To Lack of Prompt Identification and Resolution
Green. A Green self-revealing non-cited violation of 10 CFR 50, Appendix B, Criterion XVI was identified for not promptly identifying and correcting a condition adverse to quality associated with steam cuts and/or defects in the Unit 1 reactor pressure vessel (RPV) flange that resulted in increased unidentified reactor coolant system (RCS) leakage during Cycle 7 operation. The Unit 1 RPV head and flange surfaces were repaired during the following refueling outage. This finding was entered into the licensee's corrective action program (CAP) as Problem Evaluation Report 155705.

This finding was greater than minor because it was associated with the Initiating Event Cornerstone attribute of Equipment Performance, and adversely affected the cornerstone objective to limit the likelihood of those events that upset plant stability during at power operations. The finding was determined to be of very low safety significance (Green) because the maximum unidentified RCS leakage from the Unit 1 RPV flange leak was much less than the Technical Specification limit for unidentified RCS leakage of 5 gpm and would not have affected other mitigation systems resulting in a total loss of their safety function. No cross-cutting aspect was assigned to this issue because the direct cause was not considered as indicative of current performance due to improvements in the CAP since this issue occurred.

Inspection Report# : 2009002 *(pdf)*

Mitigating Systems

Significance: G Jun 30, 2009
Identified By: NRC
Item Type: NCV NonCited Violation
Failure to perform an adequate risk assessment during severe weather conditions
A Green non-cited violation of 10 CFR Part 50.65 (a)(4), “Requirements for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants,” was identified when the licensee failed to consider the impact of severe weather conditions on plant risk. Specifically, on May 1 and again on May 2, 2009, the licensee removed the A Emergency Diesel from service for planned maintenance during severe weather conditions (i.e., Tornado Warning and Tornado Watch, respectively) without re-evaluating the potential adverse affect upon the existing on-line risk assessment. The severe weather conditions only lasted about an hour each day. This issue was entered into the licensee's corrective action program as problem evaluation report 171402.

The finding was determined to be greater than minor because the licensee’s risk assessment failed to consider unusual external conditions that were present or imminent (e.g., severe weather, offsite power instability). According to Inspection Manual Chapter 0609, Appendix K, Maintenance Risk Assessment and Risk Management Significance Determination Process, the significance of this finding was determined to be of very low safety significance (Green) based on an initiating events frequency of <1.0E-7, and a very low risk deficit due to the number of redundant emergency diesels and the short duration of the severe weather. The cause of this finding was directly related to the crosscutting aspect of complete and accurate procedures in the area of human performance because the licensee’s site-specific guidelines for assessing on-line risk did not require severe weather to be considered when determining plant risk nor did they require personnel to determine if severe weather is imminent prior to removing an emergency diesel generator from service (H.2.c). (Section 1R13).

Inspection Report# : 2009003 *(pdf)*

Significance: G Mar 21, 2009
Identified By: NRC
Item Type: NCV NonCited Violation
Inadequate Surveillance Procedure Causes Loss of Unit 1 RHR System Safety Function (Section 1R22)
Inadequate Surveillance Procedure Causes Loss of Unit 1 RHR System Safety Function
Green. A self-revealing non-cited violation of Technical Specification 5.4.1, "Procedures", was identified for an incorrect Unit 1 surveillance procedure that instructed technicians to install a jumper in the wrong location which resulted in the inadvertent lockout of the Loop II residual heat removal (RHR) pumps automatic start feature while the Loop I RHR pumps were removed from service for testing. The improperly installed jumper resulted in the RHR system being unable to perform its safety function. The immediate corrective actions for this event included removal of the jumper to restore the automatic start feature of the RHR Loop II pumps, revision to the surveillance procedure to reflect the correct location for the jumper, and completion of the surveillance. This finding was entered into the licensee’s corrective action program as Problem Evaluation Report 166487.

The finding was determined to be more than minor because it was associated with the Mitigating Systems Cornerstone attribute of Procedure Quality and adversely affected the associated cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. A Phase 2 analysis was performed because the event represented a loss of the RHR system safety function. The Phase 2 analysis using Appendix A, Technical Basis for At-Power Significance Determination Process, of IMC 0609 determined that the finding was of very low safety significance (Green). The cause of this finding was directly related to the cross cutting area of Problem Identification and Resolution and the aspect of thorough evaluation of identified problems because a prior licensee-identified procedural discrepancy regarding the location of this jumper was not adequately evaluated and resolved to ensure the jumper would be installed in the correct circuit (P.1(c)).

Inspection Report# : 2009002 *(pdf)*

Significance: G Dec 31, 2008
Identified By: NRC

Item Type: NCV NonCited Violation
Failure to Maintain Requalification Examination Integrity
The inspectors identified a non-cited violation of 10 CFR 55.49 for engaging in an activity that compromised, or would have compromised but for detection by the inspectors, the integrity of examinations required by 10 CFR 55.59 that were administered in 2007 and that were planned to be administered in 2008. The examination compromise would have affected the equitable and consistent administration of the operational portion of the requalification annual examination. The inspectors identified that three job performance measures (JPM) sets administered in 2007 contained an unacceptable number of JPMs that had previously been administered during that same examination cycle. The inspectors also identified that the JPMs scheduled to be performed in the last three weeks of the 2008 requalification examination had all been previously administered in the first three weeks of the 2008 requalification examination. When notified of the examination schedule overlap issue, the licensee changed the examination schedule to prevent the overlap issue in 2008 and entered the problem into their corrective action program as problem evaluation report 158635.

This finding is more than minor because if left uncorrected, it could become a more significant safety concern, in that, licensed operators would not be adequately tested to ensure an acceptable knowledge level for performing licensed duties. Using the Licensed Operator Requalification Significance Determination Process, this finding was determined to be of very low safety significance (Green) because the performance deficiency was immediately corrected upon discovery. The cause of the finding was that the licensee did not comply with requirements of TRN-11.10, Annual Requalification Examination Development and Implementation. The finding was related to the cross-cutting aspect of procedural compliance of the work control component of the cross-cutting area of Human Performance (H.4(b)).

Inspection Report# : 2008005 *(pdf)*

Barrier Integrity

Significance: G Jul 17, 2009
Identified By: NRC
Item Type: NCV NonCited Violation
Standby Gas Treatment Subsystem 'A' Inoperable Beyond the Technical Specification Allowed Outage Time (Section 4OA2.a)
• Green. A Green, self-revealing, non-cited violation (NCV) of Technical Specification (TS) limiting condition for operation (LCO) 3.6.4.3, "Standby Gas Treatment (SGT) System", was identified for the licensee's failure to comply with the LCO required actions for one inoperable SGT subsystem due to an inadequate investigation to ensure the system's operability, on November 30, 2008, following a loss of power to one of the three relative humidity heaters. This issue was entered into the corrective action program as Problem Evaluation Report 174597. The cause of the failure of the heater was a failed relay. The relay was replaced and the system was restored to service on June 20, 2009.

The finding is similar to example 2a in Inspection Manual Chapter (IMC) 0612, Appendix E, "Examples of Minor Issues," in that the example performance deficiency is not minor if Technical Specification limits were exceeded. In accordance with IMC 0612, Appendix B, "Issue Screening," the finding is greater than minor significance because it was associated with the Barrier Integrity cornerstone attribute of Human Performance and adversely affected the cornerstone objective of maintaining the radiological barrier functionality of Standby Gas Trains. Although the licensee ultimately was able to demonstrate that the SGT system could perform its safety function without the charcoal beds and associated heaters, compliance with SGT TS was a prerequisite to providing reasonable assurance that the SGT can protect the public from radionuclide releases caused by accidents or events. 10 CFR 50.36 defines TS limiting conditions for operation as the lowest functional capability or performance levels of equipment required for safe operation of the facility. The SGT TS LCO requirement was not met and therefore the cornerstone objective for functionality as described in the TSs, was not maintained.

In accordance with IMC 0609, Attachment 4, "Phase 1 - Initial Screening and Characterization of Findings," the finding is determined to be of very low risk significance because the finding only represented a degradation of the radiological barrier function provided by the SGT system. Because this finding is of very low safety significance and

has been entered in licensee's corrective action program, the violation is being treated as a non-cited violation. The cause of this finding was directly related to the cross-cutting aspect of thorough evaluation of identified problems in the problem identification and resolution area, because the licensee failed to properly classify, prioritize and evaluate the operability of the SGT system when the heater loss of power annunciator was received [P.1(c)]. (Section 4OA2.a)

Inspection Report# : 2009006 *(pdf)*

Emergency Preparedness

Occupational Radiation Safety

Significance: G Jun 30, 2009
Identified By: Self-Revealing
Item Type: NCV NonCited Violation
Failure to comply with the requirements of an RWP by entering a posted high radiation area
A Green self-revealing non-cited violation (NCV) of TS 5.4.1, Procedures, was identified for a radiation worker who failed to follow the requirements of RWP 09270081 as required by procedure RCI 9.1, Radiation Work Permits, Rev. 57. The licensee has entered this issue into the Corrective Action Program as Problem Evaluation Report 171375. This finding is greater than minor because it is associated with the Occupational Radiation Safety Cornerstone attribute of Program and Process (Exposure Control) and adversely affected the cornerstone objective of ensuring adequate protection of worker health and safety from exposure to radiation from radioactive material during routine civilian nuclear reactor operation. The finding was evaluated using the Occupational Radiation Safety SDP and determined to be of very low safety significance (Green) because it was not related to ALARA planning, nor did it involve an overexposure or substantial potential for overexposure, and the ability to assess dose was not compromised. The cause of this finding was directly related to the cross-cutting aspect of Work Practices in the area of Human Performance, because the radiation worker failed to use self-checking prior to passing through the swing gate into the posted high radiation area (H.4.a). (Section 2OS1)

Inspection Report# : 2009003 *(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 17, 2009
Identified By: NRC
Item Type: FIN Finding

Browns Ferry PI&R Summary
The team concluded that, in general, problems were identified, evaluated, prioritized, and corrected. The licensee maintained a reasonable threshold for identifying problems as evidenced by the large number of Problem Evaluation Reports (PERs) entered annually into the CAP, management expectation that all personnel are encouraged to initiate a PER for deficiencies noted, and CAP procedures requiring all personnel initiate PERs to document Significant Conditions Adverse to Quality (SCAQs), Conditions Adverse to Quality (CAQs), and potential items for improvement. However, some deficiencies were identified by the inspection team which were not previously entered into the CAP. Generally, the licensee prioritized and evaluated issues, conducted adequate formal root cause evaluations for significant problems, and corrective actions specified for problems were acceptable. Overall, corrective actions developed and implemented for issues were generally effective. However, the team identified some examples where corrective actions were not fully effective.

The team determined that overall, audits and self-assessments were adequate in identifying deficiencies and areas for improvement in the CAP, and generally, appropriate corrective actions were developed to address these issues. However, the team noted that a significant number of deficiencies were identified through self assessments of the CAP, which was indicative of a program that, while improved, has yet to reach the licensee's own desired level of effectiveness. Specifically, a large number of PERs associated with corrective maintenance work orders were not written even though generation of such PERs was explicitly required by corrective action program procedures.

Based on discussions and interviews conducted with plant employees from various departments, the inspectors did not identify any reluctance by workers to report safety concerns, or utilize the corrective action program.

The team determined that corrective actions implemented, and planned to be implemented, to address the substantive cross-cutting issue in problem identification and resolution identified by the NRC in its annual assessment letter dated March 3, 2008, were appropriate. The team noted that some corrective actions to prevent recurrence associated with the substantive cross-cutting issue problem evaluation report (PER) were improperly implemented and ineffective. Specifically, the corrective action implemented to initiate PERs for all Corrective Maintenance Work Orders (CMWO) was ineffective in that several hundred CMWOs did not have PERs initiated.

Inspection Report# : 2009006 *(pdf)*

Significance: N/A Dec 31, 2008
Identified By: NRC
Item Type: FIN Finding
95002 Supplemental Inspection Report Summary
The Nuclear Regulatory Commission (NRC) performed this supplemental inspection to assess the licensee's evaluations associated with the Unit 1 Initiating Events Cornerstone performance indicator (PI) for Unplanned Scrams per 7000 Critical Hours having been in the Yellow performance band. Unit 1 restarted on May 21, 2007, after a 22 year shutdown. Pursuant to NRC letter to Tennessee Valley Authority, dated December 6, 2007, this PI was to be considered valid with the data reported at the end of the 4th quarter 2007. At that time, this PI was in the Yellow performance band due to the limited number of hours the reactor had been critical and the five unplanned reactor scrams which had occurred. As a result, with the reporting of 4th quarter 2007 PI data, Unit 1 was in the Degraded Cornerstone column of the NRC's Action Matrix.

The inspection team determined that the licensee performed a comprehensive review of each of the reactor scrams individually. Revised root cause evaluations for each of the scrams appropriately evaluated the root and contributing causes, addressed the extent of condition and cause, and assessed safety culture. Corrective actions identified for the scrams, extent of cause, and identified safety culture weakness were found to be sufficient to address the root causes and contributing causes.

The inspection team found that the licensee had performed an adequate common cause review of the five scrams and a safety culture assessment. The licensee concluded that an "unhealthy safety culture," with respect to the decision making, work control, human performance and problem identification and resolution areas, was a common cause to the scrams. This environment was principally associated with the completion of Unit 1 pre-restart and restart activities. Furthermore, the licensee concluded that once this environment was established, it continued to manifest itself during operation and maintenance of the subject systems after restart. The inspection team determined that the licensee had taken adequate interim measures to address the undesirable environment while long term corrective

actions were being implemented. The inspection team also determined that the safety culture issues had not involved reluctance by plant personnel to bring potential safety issues to management's attention.

The inspection team performed a review of a licensee self-assessment which reviewed the actions taken to address the five scrams, the extent of condition and cause, the identified corrective actions, and performed an assessment of safety culture. The inspection team assessed that the licensee's review was adequate and that appropriate actions were taken or planned as a result of adverse conditions and weaknesses identified by the self-assessment.

In addition to assessing the licensee's evaluations, the inspection team performed an independent extent of condition and extent of cause review and a focused inspection of the site safety culture. Overall, the inspection team concluded that the licensee's cause and corrective actions established or planned to improve site performance were adequate, that an adequate extent of condition and extent of cause was performed, and that safety culture issues were appropriately identified. Adequate interim measures were taken for corrective action program implementation issues identified by the licensee's common cause extent of condition evaluation.

Based upon the inspection results, no findings of significance were identified. The inspection team observed some corrective action program procedure implementation deficiencies which were entered into the licensee's corrective action program for resolution.

This inspection completed the NRC reactive inspection activities associated with the Unit 1 Yellow PI for Unplanned Scram per 7000 Critical Hours. The PI returned to the White performance band and Green performance band in the first and second quarters of calendar year 2008, respectively.

Inspection Report# : 2008010 *(pdf)*

Significance: N/A Oct 24, 2008
Identified By: NRC
Item Type: FIN Finding
Problem identification Assessment results
The team concluded that, in general, problems were identified, evaluated, prioritized, and corrected. The licensee was adequate at identifying problems and entering them into the corrective action program (CAP) for resolution. The licensee maintained a reasonable threshold for identifying problems as evidenced by the large number of Problem Evaluation Reports (PERs) entered annually into the CAP, management expectation that all personnel are encouraged to initiate a PER for any deficiency noted, and CAP procedures requiring all personnel initiate PERs to document Significant Conditions Adverse to Quality (SCAQs), Conditions Adverse to Quality (CAQs), and potential items for improvement. However, some deficiencies were identified by the inspection team of issues not previously entered into the CAP. Generally, the licensee prioritized and evaluated issues, formal root cause evaluations for significant problems were adequate, and corrective actions specified for problems were acceptable. Overall, corrective actions developed and implemented for issues were generally effective. However, the team also identified examples where corrective actions were not effective.

The team determined that overall, audits and self-assessments were adequate in identifying deficiencies and areas for improvement in the CAP, and generally, appropriate corrective actions were developed to address these issues. Operating experience usage was found to be generally acceptable and integrated into the licensee's processes for performing and managing work, and plant operations. However, the team found examples where operating experience was not adequately addressed.

Based on discussions and interviews conducted with plant employees from various departments, the inspectors did not identify any reluctance by workers to report safety concerns, or utilize the corrective action program.

The team determined that corrective actions implemented, and planned to be implemented, to address the substantive cross-cutting issue in problem identification and resolution identified by the NRC in its annual assessment letter dated March 3, 2008, were appropriate. The team
noted that the only corrective action to prevent recurrence for one of the common causes may not be sufficient to prevent recurrence. However, there were several other corrective actions
credited from other PERs already implemented to address this common cause which the team considered to be appropriate. Additionally, a root cause evaluation team has been chartered to determine if any other corrective actions

should be taken.

Inspection Report# : 2008007 *(pdf)*

Last modified : December 10, 2009