

# Browns Ferry 2

## 1Q/2009 Plant Inspection Findings

---

### Initiating Events

**Significance:**  Oct 04, 2008

Identified By: Self-Revealing

Item Type: FIN Finding

#### **Main Generator Voltage Regulator Relay Failure Results in Unit 2 Reactor Scram**

Green. A Green self-revealing finding was identified for inadequate design control and replacement of the 43A relay in the Unit 2 main generator voltage regulator control circuit that resulted in a reactor scram due to a main turbine generator trip from a loss of main generator excitation. The failed 43A relay was subsequently replaced with another model relay better suited to low energy control circuit applications. This finding was entered into the licensee's corrective action program as Problem Evaluation Report 153987.

This finding was greater than minor because it was associated with the Initiating Event Cornerstone attribute of Design Control, 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 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 area of Human Performance and the aspect of conservative assumptions and safe actions, because the licensee's design change process was expedited such that important technical considerations regarding equipment reliability and operating experience were not adequately evaluated to ensure optimum relay selection for use in low voltage control circuit applications (H.1.b).

Inspection Report# : [2009002](#) (pdf)

---

### Mitigating Systems

**Significance:**  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*)

**Significance:**  Oct 24, 2008

Identified By: NRC

Item Type: NCV NonCited Violation

**Failure to Identify an Adverse Trend for Vibration-induced, Failed or Degraded Unit 2 and 3 RHR Hx SW Outlet FCVs**

An NRC-identified, Green, non-cited violation of 10 CFR 50, Appendix B, Criterion II, "Quality Assurance Program," was identified for the licensee's failure, between April 2000 and January 2008, to carry out the Nuclear Quality Assurance Plan policy in that trend analysis performed on adverse conditions did not result in trend results which identified vibration-induced, failed or degraded residual heat removal (RHR) heat exchanger (Hx) service water (SW) outlet flow control valves (FCVs) as an adverse trend that needed increased management attention. Between April 2000 and January 2008, there were 17 instances of failed or degraded Unit 2 and 3 RHR Hx SW outlet FCVs due to vibration-induced damage entered into the licensee's corrective action program (CAP). This issue has been identified in the licensee's CAP as Problem Evaluation report 159606. Corrective actions associated with the vibration-induced damage included actions to replace Units 2 and 3 RHR Hx SW outlet FCVs with the same valves used on Unit 1 and to reconfigure all three units with a smaller bypass valve around the RHR Hx SW outlet FCVs.

This finding was more than minor because it affected the Mitigating System cornerstone objective of ensuring the reliability of systems that respond to initiating events to prevent undesirable consequences and the cornerstone's attribute of equipment performance. Using the Significance Determination Process, the finding was determined to be of very low safety significance due to the RHR Hx SW outlet FCV occurrences, in which the RHR Hx SW outlet FCVs would not perform their safety function, did not represent an actual loss of a safety function of a single RHR SW train for greater than its Technical Specification allowed outage time. The cause of this finding was directly related to the Trend Performance in the CAP cross-cutting aspect of the Problem Identification and Resolution cross-cutting area, in that, the licensee failed to properly assess information in their CAP to identify the common cause problem of vibration-induced degraded and inoperable RHR Hx SW outlet FCVs.(P.1(b)).

Inspection Report# : [2008007](#) (*pdf*)

**Significance:**  Jun 30, 2008

Identified By: NRC

Item Type: NCV NonCited Violation

**Failure to Identify and Correct Deficiencies in Degraded Flood Protection Doors**

The NRC identified a Green non-cited violation of 10 CFR 50, Appendix B, Criterion XVI, Corrective Action, for the licensee's failure to identify and correct deficiencies in watertight doors that protect the safety-related Residual Heat Removal Service Water pumps and Emergency Equipment Cooling Water pumps from external flooding. The licensee issued work orders to correct the conditions and entered the issue into their corrective action program as Problem Evaluation Reports 133891 and 134346.

This finding was more than minor because it affects the External Factors (Flood Hazard) attribute of the Mitigating Systems Cornerstone. It impacted the cornerstone objective of ensuring the availability, reliability, and operability of safety-related pumps to perform their intended safety function during a design basis flooding event. A Significance Determination Process Phase 3 analysis determined that the finding was of very low safety significance because of the low likelihood of the design basis flood. The finding was directly related to the cross-cutting aspect of procedural compliance of the work control component of the cross-cutting area of Human Performance. Mechanics were not complying with quarterly work orders and maintenance procedure to assure functionality of the watertight doors (H.4 (b)).

## Barrier Integrity

---

## Emergency Preparedness

---

## Occupational Radiation Safety

---

## Public Radiation Safety

**Significance:**  Jun 30, 2008

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

### **Failure to Secure Stored Radioactive Material from Unauthorized Removal**

A Green, self-revealing non-cited violation of 10 CFR 20.1801 was identified for the licensee's failure to secure stored radioactive material from unauthorized removal. On August 14, 2007, a shipment of "clean" scrap metal from Browns Ferry alarmed the truck monitor at a vendor recycling facility. Using a hand-held survey instrument, the vendor identified the contaminated item to be a small (4 ounces) metal can containing pipe threading compound. Subsequently, upon arrival at the site, licensee personnel retrieved the item and performed radiation surveys as necessary. The finding was entered into the licensee's corrective action program as Problem Evaluation Report 128870.

This finding was more than minor because it was associated with the Public Radiation Safety cornerstone attribute of program and process and it affected the associated cornerstone objective because the failure to secure stored radioactive material from removal did not ensure the adequate protection of public health and safety from exposure to radiation. The finding was evaluated using the Public Radiation Safety Significance Determination Process and was determined to be of very low safety significance because the failure to secure radioactive material from removal was a finding in the radioactive material control program that did not result in a public exposure exceeding 5 mrem. The cause of this finding was related to the evaluation of identified problems cross-cutting aspect in the corrective action component of the Problem Identification and Resolution cross-cutting area because evaluations performed by the licensee subsequent to previous radioactive material control events had failed to thoroughly evaluate and identify the weaknesses in the radioactive material control program (P.1(c)).

## 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 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 : May 28, 2009