

# Browns Ferry 1

## 1Q/2009 Plant Inspection Findings

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### Initiating Events

**Significance:**  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*)

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### Mitigating Systems

**Significance:**  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:**  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:**  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)).

Inspection Report# : [2008003](#) (*pdf*)

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## Barrier Integrity

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## Emergency Preparedness

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## Occupational Radiation Safety

**Significance:**  Jun 30, 2008

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

### **Failure to Conspicuously Post, Barricade, and Control Access to a High Radiation Area During Power Ascension**

A Green, self-revealing non-cited violation of Technical Specification (TS) 5.7.1 was identified for the licensee's failure to conspicuously post, barricade, and control access to a high radiation area (HRA) with dose rates not exceeding 1.0 rem per hour at 30 centimeters from the source. On June 13, 2007, operations personnel raised Unit 1 reactor power from 25 percent rated thermal power (RTP) to 34 percent RTP, resulting in general area dose rates in the Unit 1 turbine building moisture separator room increasing to greater than 100 millirem/hour (mrem/hr), making it an HRA. But contrary to TS 5.7.1., the room was posted and controlled as a radiation area at the time of the power increase. Three individuals working in the room received electronic dosimeter dose rate alarms of 140 mrem/hr, 212 mrem/hr, and 215 mrem/hr. Once the change in radiological conditions was recognized, radiological control personnel immediately posted and controlled the work area as an HRA. The finding was entered into the licensee's corrective action program as Problem Evaluation Report 126211.

This finding was more than minor because it was associated with the Occupational Radiation Safety cornerstone attribute of exposure control and it affected the associated cornerstone objective because the failure to post, barricade, and control access to an HRA did not ensure the adequate protection of worker health and safety from exposure to radiation. The finding was evaluated using the Occupational Radiation Safety Significance Determination Process and was determined to be of very low safety significance because the finding did not involve a substantial potential for overexposure and did not affect the ability to assess dose. The cause of this finding was directly related to the work activity coordination cross-cutting aspect in the work control component of the Human Performance cross-cutting area because operations and health physicists personnel failed to effectively communicate and coordinate the activities associated with the power increase (H.3(b)).

Inspection Report# : [2008003](#) (*pdf*)

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## 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)).

Inspection Report# : [2008003](#) (*pdf*)

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## 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.

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## Miscellaneous

**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 : May 28, 2009