

# Browns Ferry 1

## 2Q/2012 Plant Inspection Findings

### Initiating Events

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**Significance:** Mar 31, 2012

Identified By: NRC

Item Type: NCV NonCited Violation

#### Failure to immediately report a plant fire

The NRC identified a non-cited violation of Technical Specification 5.4.1.d, Fire Protection Program implementation associated with the licensee's failure to report a fire in the Unit 1 Turbine Building to the main control room (MCR). Specifically, the failure to report a plant fire resulted in a failure of the MCR operators to implement Emergency Plan Implementing Procedure EPIP-17, Fire Emergency Response. Following the event, plant staff performed additional inspections of plant areas and either removed electrical extension cords or ensured each cord had a required GFCI and was not overloaded. Expectations for plant employees discovering and responding to fires were reinforced by plant management. The licensee entered this event into their corrective action program as PER 527090.

The performance deficiency was determined to be more than minor because if left uncorrected, the failure to notify the MCR of plant fire events would have the potential to lead to a more significant safety concern. Specifically, emergency response procedures for plant fires would not be entered and implemented and the Fire Brigade response would be delayed. The significance of this finding was evaluated in accordance with the IMC 0609, Appendix F, Attachment 1, Part 1, Fire Protection SDP Phase 1 Worksheet. The inspectors concluded that the significance of this finding was Green due to a low degradation rating for this fire event because it was a small electrical fire with no combustible material within the vicinity of the fire. The cause of this finding was directly related to the cross cutting aspect of Procedural Compliance in the Work Practices component of the Human Performance area, because the licensee failed to recognize the requirement to immediately report a fire and enter the appropriate fire emergency response procedures [H.4(b)]. (Section 4OA3.4)

Inspection Report# : [2012002](#) (pdf)

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**Significance:** Dec 31, 2011

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

#### Failure to control temporary equipment resulted in a fire

A self-revealing non-cited violation of 10 CFR 50 Appendix B, Criterion V, Instructions, Procedures and Drawings was identified for the licensee's failure to install and maintain adequate control of temporary lighting in the intake cable tunnel as required by the Tennessee Valley Authority (TVA) Safety Manual and NPG-SPP-09.17, Temporary Equipment Control. Consequently, a temporary light string was left improperly installed, without ground fault circuit interrupt (GFCI) device(s), for over two years until it faulted electrically and caused a fire in the intake cable tunnel on October 12, 2011. The fire brigade extinguished the fire in approximately 10 minutes and removed the temporary light string from the cable tunnel. The licensee entered this event into their corrective action program as PER 445331.

The finding was determined to be more than minor because it was considered sufficiently similar to example 4.f of Inspection Manual Chapter (IMC) 0612, Appendix E, for an issue of concern that resulted in a fire hazard in a safety-related area of the plant. The finding was associated with the Initiating Events Cornerstone and characterized according to IMC 0609, Significance Determination Process (SDP), Attachment 04, Phase 1 - Initial Screening and Characterization of Findings. The results of this analysis required an evaluation in accordance with IMC 0609, Appendix F, Attachment 01, Part 1, Fire Protection SDP Phase 1 Worksheet. For the SDP Phase 1 evaluation a high degradation rating was assigned for this fire event with a duration factor greater than 30 days. When compared against the SDP Phase 1 screening criteria, this resulted in a SDP Phase 2 evaluation. The inspectors concluded that this finding screened to Green in the Appendix F Phase 2 analysis using Appendix F Attachment 01, Part 2, Fire

Protection SDP Phase 2 Worksheet. Specifically, it was determined that the fire could not reach the temperature threshold for fire-induced cable failure and would not spread to other combustible materials in the area. The cause of this finding was directly related to the cross cutting aspect of Long-Standing Equipment Issues in the Resources component of the Human Performance area, because the deficiencies with the permanently installed lighting system in the intake cable necessitated the use of the temporary light stringer for more than two years [H.2(a)]. (Section 4OA3.4)

Inspection Report# : [2011005](#) (pdf)

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**Significance:** Sep 30, 2011

Identified By: NRC

Item Type: NCV NonCited Violation

#### **Failure to control transient combustible materials in the Unit 1 reactor building**

A NRC-identified non-cited violation of the Technical Specifications 5.4.1.d, Fire Protection Program Implementation, was identified for the licensee's failure to control transient combustible materials in a designated exclusion area between Fire Zones 1-1 and 1-2 in the Unit 1 reactor building. Specifically, on August 12, 2011, the inspectors identified transient combustible materials left unattended in the designated exclusion area between Loops I and II of the low pressure coolant injection (LPCI) system following LPCI injection valve maintenance activities. Upon notification by the inspectors, the licensee promptly removed the materials. This issue was entered into the licensee's corrective action program as problem evaluation report (PER) 418101.

The finding was determined to be greater than minor because it was similar to example 4.k. of Inspection Manual Chapter (IMC) 0612, Appendix E, for an issue of concern involving transient combustibles in a designated combustible free area required for separation of redundant safe shutdown trains. The safety significance of the finding was characterized using IMC 0609, Significance Determination Process (SDP), Appendix F, Attachment 1, Fire Protection SDP Phase 1 Worksheet, and determined to be of very low safety significance because of a low degradation rating since a roving fire watch was already established in this same area for an another fire impairment while the transient combustibles were left unattended. The cause of this finding was directly related to the cross cutting aspect of effectively communicating expectations regarding procedural compliance in the Work Practices component of the Human Performance area, because the expectations for the removal of combustible materials from this area were not effectively communicated to the night shift personnel [H.4(b)]. (Section 1RO5.1)

Inspection Report# : [2011004](#) (pdf)

G

**Significance:** Sep 30, 2011

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

#### **Unit 1 loss of shutdown cooling caused by emergency diesel generator output breaker trip**

A self-revealing non-cited violation of Technical Specifications 5.4.1.a was identified for the licensee's failure to establish an adequate maintenance procedure to ensure appropriate calibration and alignment of the Emergency Diesel Generator (EDG) overspeed trip limit switch (OTLS) arm. The lack of procedure guidance resulted in an improperly adjusted OTLS that caused a premature trip of the A EDG output breaker and loss of Unit 1 shutdown cooling (SDC) on May 2, 2011. The licensee replaced and properly set the OTLS on the A EDG, verified the OTLS setpoint on all other seven EDGs, and initiated revisions to applicable maintenance procedures. This issue was entered into the licensee's corrective action program as problem evaluation report (PER) 362340.

The finding was determined to be greater than minor because it was associated with the Initiating Events 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 shutdown. Specifically, the misadjusted A EDG OTLS resulted in a premature trip of the A EDG output breaker and a loss of Unit 1 SDC. According to Inspection Manual Chapter (IMC) 0609, Significance Determination Process (SDP), Appendix G, Shutdown Operations, Table 1, Losses of Control, the safety significance of the finding was initially characterized to be potentially greater than very low safety significance because the inadvertent loss of SDC represented a loss of control due to a loss of thermal margin to boiling greater than 20 percent. However, a Phase 3 analysis was performed by a Senior Reactor Analyst, it was determined the loss of SDC event was of very low risk significance (i.e., Green), due in

part to a low change in risk because of a high chance of recovery of offsite power before the duration of time required to cause the EDG to trip, and the likelihood of recovery of the tripped EDG. The cause of this finding was directly related to the cross-cutting aspect of appropriate self assessments in the Self and Independent Assessments component of the Problem Identification and Resolution area, because inadequate technical rigor applied by the licensee to recognize single point system vulnerabilities resulted in inadequate procedural guidance for maintenance personnel to appropriately calibrate and align the OTLS switch arm and overspeed trip lever [P.3.(a)]. (Section 4OA3.2)

Inspection Report# : [2011004](#) (*pdf*)

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## Mitigating Systems

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**Significance:** Jun 30, 2012

Identified By: NRC

Item Type: NCV NonCited Violation

### **Failure to maintain flood barrier results in inoperable safety related pumps**

An NRC-identified non-cited violation (NCV) of the Technical Specifications 5.4.1.a was identified for the licensee's failure to maintain an Emergency Equipment Cooling Water (EECW) pump flood barrier in accordance with written procedures which resulted in the inoperability of two other safety related pumps. The licensee immediately restored the flood protection configuration of the C Residual Heat Removal Service Water (RHRSW) pump room by properly re-installing the flood protection cover and permanently stenciled the aluminum plate with the required procedure for installation. The licensee entered this issue into their corrective action program as PER 532050.

The finding was more than minor because it was associated with the Mitigating Systems cornerstone attribute of Protection Against External Events, and adversely affected the cornerstone objective to ensure the availability, reliability, and capability of RHRSW pumps to perform their intended safety function during a design basis flooding event. Specifically, the improper re-installation of an external flood protection cover resulted in the inoperability of two Residual Heat Removal Service Water (RHRSW) pumps. The significance of this finding was evaluated in accordance with the IMC 0609 Attachment 4, Phase 1- Initial Screening and Characterization of Findings, which required a Phase 3 analysis because the finding involved the degradation of equipment designed to mitigate a flooding event and it was risk significant due to external initiating event core damage sequences. The finding was determined to be Green because of the short exposure time, and the low likelihood of the flood. The cause of this finding was directly related to the cross cutting aspect of Supervisory Oversight in the Work Practices component of the Human Performance area, because of the foreman's assumption that workers knew to restore the flood protection cover to meet procedural requirements without a formal pre-job brief [H.4(c)]. (Section 1R15)

Inspection Report# : [2012003](#) (*pdf*)

**G**

**Significance:** May 14, 2012

Identified By: NRC

Item Type: FIN Finding

### **Failure to follow NRC commitment management procedure**

The inspectors identified a Green finding (FIN) for the licensee's failure to follow procedure NPG-SPP-03.3, Rev.001, "NRC Commitment Management." Specifically, the procedure states, in part, that each responsible organization ensures commitment implementation/completion occurs as scheduled. Contrary to this requirement, the licensee's commitment to verify the accuracy and adequacy of completed Inspection Procedure (IP) 95002 corrective actions had not been performed adequately. The licensee entered this issue into the corrective action program as PERs 510126 and 510161.

The performance deficiency (PD) associated with this finding was the failure of licensee personnel to follow procedures regarding managing NRC commitments. The finding is greater than minor because, if left uncorrected, the finding would have the potential to lead to a more significant safety concern. Specifically, the failure to assess the adequacy of corrective actions can lead to problems not being properly corrected. Using Manual Chapter 0609.04,

"Phase 1 – Initial Screening and Characterization of Findings," the finding was determined to have a very low safety significance (Green) because the finding did not result in a loss of system safety function, an actual loss of safety function of a single train for greater than its Technical Specification allowed outage time, or screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event. This finding has a cross cutting aspect in the area of Human Performance because the licensee did not ensure supervisory and management oversight of work activities associated with the commitments made to the NRC, which resulted in the commitments not be tracked or monitored to ensure completion. [H.4(c)] (Section 4OA2.a(3))

Inspection Report# : [2012007](#) (pdf)

G

**Significance:** May 14, 2012

Identified By: NRC

Item Type: NCV NonCited Violation

#### **Failure to establish adequate compensatory measures for non-conforming fire barriers**

The inspectors identified a Green NCV of Browns Ferry Operating License

Conditions 2.C(13), 2.C(14) and 2.C(7), for Units 1, 2, and 3, respectively, for the licensee's failure to establish adequate compensatory measures for non-conforming fire barriers, in accordance with the approved fire protection program (FPP). Specifically, the licensee failed to establish continuous fire watches for non-conforming fire barriers in the Intake Pumping Station (IPS), after discovering that the barriers were not credited in the site's approved FPP. The licensee initiated PER 509589 to document this condition and enter it into the corrective action program. The licensee also established a continuous fire watch, in accordance with the FPR.

The licensee's failure to establish adequate compensatory measures for non-conforming fire barriers, as required by their approved fire protection program, is a PD. The finding is more than minor because it is associated with the Reactor Safety Mitigating Systems cornerstone attribute of protection against external factors (i.e., fire) and it affects the cornerstone objective of ensuring the reliability and capability of systems that respond to initiating events. Using the guidance of IMC 0609, Appendix F, "Fire Protection Significance Determination Process," inspectors determined that the PD represented a finding of very low safety significance (Green). Inspectors determined that the cause of this finding has a cross-cutting aspect in the Corrective Action Program component of the Problem Identification and Resolution (PI&R) area, in that it was directly related to the licensee not thoroughly evaluating problems, such that the problem was properly classified and evaluated for operability [P.1(c)] (Section 4OA2.a(3))

Inspection Report# : [2012007](#) (pdf)

G

**Significance:** May 14, 2012

Identified By: NRC

Item Type: NCV NonCited Violation

#### **Failure to implement appropriate safe shutdown instructions**

The inspectors identified a Green non-cited violation of 10 CFR 50 Appendix B, Criteria XVI, Corrective Action, for the licensee's failure to assure conditions adverse to quality associated with the establishment and implementation of four new Safe Shutdown Instructions (SSI) were promptly identified and corrected. Specifically, the inspectors identified instances where previously identified issues with SSIs were either not entered into the corrective action program, corrective actions were not implemented, or the corrective actions were ineffective in addressing the identified issue. The licensee entered this finding into the corrective action program (PER 505551) and adequate procedural guidance was restored following licensee procedure revisions, training and demonstration to inspectors that operators had acquired an adequate level of proficiency to implement the new SSIs.

This finding is more than minor because it is associated with the procedure quality attribute of the Mitigating Systems cornerstone and it affected the cornerstone objective of protection against external events, such as fire, to prevent undesirable consequences. The finding was assigned a Low degradation rating and screened as very low safety significance (Green) in step 1.3.1 of IMC 0609 Appendix F, attachment 1, Application of Fire Protection SDP Phase 1 Worksheet. This finding was directly related to the cross-cutting aspect of Thorough Evaluation of Identified Problems in the Corrective Action Program component of the Problem Identification and Resolution area because the

licensee did not thoroughly evaluate identified problems such that the resolutions addresses the causes and extent of conditions of the issues. [P.1.(c)] (Section 4OA2.e(2))

Inspection Report# : [2012007](#) (pdf)

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**Significance:** May 14, 2012

Identified By: NRC

Item Type: NCV NonCited Violation

**Failure to identify and correct appropriate safe shutdown instructions**

The inspectors identified an NCV of 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," for the licensee's failure to establish procedures appropriate to the circumstances for combating plant fires.

Specifically, four new Safe Shutdown Instruction (SSI) were established which contained multiple procedural deficiencies. The licensee entered this finding into the corrective action program (PER 507721) and adequate Safe Shutdown Instructions were restored following procedure revisions.

This finding is more than minor because it is associated with the procedure quality attribute of the Mitigating Systems cornerstone and it affected the cornerstone objective of protection against external events such as fire to prevent undesirable consequences. The finding was assigned a Low degradation rating and screened as very low safety significance (Green) in step 1.3.1 of IMC 0609 Appendix F, attachment 1, Application of Fire Protection SDP Phase 1 Worksheet. The team determined the cause of this finding was directly related to the cross-cutting aspect of Work Coordination in the Work Control component of the Human Performance area because the licensee did not adequately incorporate actions to address the impact of the work on different job activities and the need for work groups to maintain interfaces with offsite organizations, and communicate, coordinate, and cooperate with each other during activities in which interdepartmental coordination is necessary to assure plant and human performance. This contributed to the failure to identify deficiencies with the new SSI procedures prior to procedure implementation. [H.3.(b)] (Section 4OA2.e(2))

Inspection Report# : [2012007](#) (pdf)

**Significance:** TBD May 14, 2012

Identified By: NRC

Item Type: AV Apparent Violation

**Failure to properly implement the requirements of teh plant modifications and engineering change control procedure**

The inspectors identified an apparent violation of 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," for the licensee's failure to adequately implement requirements contained in procedure NPG-SPP-09.3 "Plant Modifications and Engineering Change Control". Specifically, the licensee failed to adequately identify and perform required training for implementation of four new Safe Shutdown Instructions (SSI) in support of a Design Change Notice (DCN) implementation. The licensee entered this finding into the corrective action program (PER 507721) and adequate procedural guidance was restored following licensee procedure revisions, training and demonstration to inspectors that operators had acquired an adequate level of proficiency to implement the new SSI methodology.

This finding is more than minor because it is associated with the protection against external events attribute of the Mitigating Systems cornerstone and it affected the cornerstone objective to prevent undesirable consequences from initiating events, such as fire. Because the finding could not be screened as very low safety significance (Green), nor its safety significance determined prior to issuing the inspection report, it is being characterized as "To Be Determined (TBD)." The finding does not present an immediate safety concern because the licensee has subsequently performed procedure revisions, training and demonstrated to inspectors that operators have acquired an adequate level of proficiency to implement the new SSI methodology to mitigate plant events should they occur.

The team determined the cause of this finding was directly related to the cross-cutting aspect of Work Coordination in the Work Control component of the Human Performance area because the licensee did not adequately incorporate actions to address the impact of the work on different job activities, and the need for work groups to maintain interfaces with offsite organizations, and communicate, coordinate, and cooperate with each other during activities in

which interdepartmental coordination is necessary to assure plant and human performance. This contributed to the failure to conduct a training needs analysis (TNA) for the new SSI procedures and perform adequate operator training prior to procedure implementation. [H.3.(b)] (Section 4OA2.e(2))

Inspection Report# : [2012007](#) (pdf)

G

**Significance:** Mar 31, 2012

Identified By: NRC

Item Type: NCV NonCited Violation

**Failure to adequately implement impaired fire barrier and detector controls**

The NRC identified a non-cited violation of Technical Specification 5.4.1.d, Fire Protection Program, for the licensee's failure to adequately implement Limiting Conditions For Operation in accordance with Fire Protection Report Volume 1, Fire Protection Plan. Specifically, the licensee failed to adequately implement impaired fire barrier and detector controls which resulted in the failure to establish a continuous fire watch for an impaired fire barrier having smoke detection identified as unavailable to protect either side of the inoperable barrier. The licensee subsequently returned the impaired fire door and smoke detection to service. The licensee entered this event into their corrective action program as PERs 529543 and 527311.

The finding was determined to be more than minor because it was associated with the Mitigating Systems cornerstone attribute of Protection Against External Events, and adversely affected the cornerstone objective to ensure the availability of systems that respond to initiating events to prevent undesirable consequences (i.e. core damage). Specifically, inadequate implementation of the licensee's FPIP and LCO processes resulted in the licensee missing a LCO entry condition and not establishing a continuous fire watch for an impaired fire door. The significance of this finding was evaluated in accordance with the IMC 0609 Appendix F, Attachment 01, Part 1, Fire Protection SDP Phase 1 Worksheet. The finding was determined to be of very low safety significance (Green) because the condition represented a low degradation of fire prevention and administrative controls. Specifically, a smoke detection system on one side of the impaired fire door was discovered functional. The cause of this finding was directly related to the cross cutting aspect of Procedural Compliance in the Work Practices component of the Human Performance area, because licensee expectations were ineffectively communicated and fire protection procedures inadequately implemented to maintain a site understanding of fire barrier and detector configuration [H.4(b)]. (Section 1RO5)

Inspection Report# : [2012002](#) (pdf)

G

**Significance:** Dec 30, 2011

Identified By: NRC

Item Type: NCV NonCited Violation

**Degraded electrolytic capacitor test results not entered into corrective action program**

The team identified a finding of very low safety significance (Green) and associated Non-Cited Violation of 10 CFR Part 50, Appendix B, Criterion XVI, Corrective Action, for the failure to promptly identify and correct a condition adverse to quality related to the electrolytic capacitors on the battery charger for main battery number 3. Specifically, the licensee failed to identify and correct results from ripple tests conducted on August 8, 2010, that showed degradation until questioned by the team on

November 20, 2011. When the capacitors were retested in December 2011, similar results were obtained and the battery charger was determined to be degraded and was removed from service. The licensee entered this finding into their Corrective Action Program, removed the affected battery charger from service, initiated actions to expedite replacement of the electrolytic capacitors, and improved the capacitor testing procedure.

The performance deficiency was determined to be more than minor because it was associated with the Mitigating Systems Cornerstone attribute of Equipment Performance, and affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, failing to identify the test results that indicated the electrolytic capacitors were degraded and take corrective actions could have resulted in the failure of the battery chargers to perform their safety function and respond to initiating events. The safety significance of the finding was characterized using Inspection Manual Chapter (IMC) 0609, Significance Determination Process (SDP), Appendix A, and determined to be of very low safety significance

because the finding was not a design deficiency confirmed not to result in a loss of safety function of a system or a train. The cause of this finding was directly related to the cross-cutting aspect of maintenance in the Resources component of the Human Performance area, because the licensee did not ensure that personnel, equipment, procedures, and other resources are available and adequate to assure nuclear safety. Specifically, the licensee did not have complete, accurate, up-to-date procedures and work orders for periodic testing and replacement of the electrolytic capacitors in the battery chargers. [H.2(c)] (4OA4.02.02.b)

Inspection Report# : [2011012](#) (pdf)

G

**Significance:** Oct 03, 2011

Identified By: NRC

Item Type: NCV NonCited Violation

**Failure to implement requirements of the inservice testing program**

The inspectors identified a NCV of very low safety significance for the licensee's failure to implement a procedure required by Technical Specification (TS) 5.5.6, Inservice Testing Program. Specifically, inspectors determined that TVA did not adequately implement 0-TI-362, "Inservice Testing of Pumps and Valves.", which required that a Service Request (SR) be documented in the CAP when pumps are found to be in the Alert Range during inservice testing.

The inspectors determined that the failure to implement procedure 0-TI-362 constituted a performance deficiency. This performance deficiency was determined to be more than minor in accordance with IMC 0612 Appendix B, "Issue Screening" because if left uncorrected, the failure to enter degraded conditions in the CAP has the potential to lead to a more serious safety concern. The inspectors screened this finding in accordance with Inspection Manual Chapter (IMC) 0609, "Significance Determination Process," Attachment 4, "Phase 1 - Initial Screening and Characterization of Findings," and determined 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, the component of the corrective action program and the aspect of issue identification; because the licensee failed to implement the corrective action program. [P.1(a)] (Section 4OA4.2.d(1))

Inspection Report# : [2011011](#) (pdf)

G

**Significance:** Oct 03, 2011

Identified By: NRC

Item Type: NCV NonCited Violation

**Failure to reestablish motor operated valve design basis capability after performing modifications to the valves**

The inspectors identified a finding of very low safety significance and associated non-cited violation of 10 CFR Part 50.55a(b)(3)(ii), for the licensee's failure to adequately reestablish the design basis capability of multiple Motor Operated Valves (MOVs) after internal modifications were performed to the valves.

The NRC inspectors determined that the methodology described in the TVA documentation for justifying the design-basis capability of MOVs and the specific justification prepared by TVA to reestablish the design basis capability of MOVs after undergoing internal modifications did not satisfy 10 CFR 50.55a(b)(3)(ii), and was a performance deficiency. Further, this was determined to be a programmatic issue because there were at least 12 examples of other modified MOVs where the licensee implemented its methodology that did not provide an adequate justification for the design basis capability of those MOVs that would satisfy 10 CFR 50.55a(b)(3)(ii). The NRC staff determined the finding to be more than minor because the program deficiency, if left uncorrected, could become a more significant safety concern. Specifically, by establishing a design basis MOV valve factor that TVA considered to be conservative using data from two tested valves obtained from the JOG MOV Performance Verification program without demonstrating its applicability to the Browns Ferry valves, BFN personnel might not realize that the established valve factor is the minimum value that must be used to set up MOV actuator operating parameters. The inspectors concluded this finding was associated with the Mitigating Systems Cornerstone. The inspectors determined the finding could be evaluated using the Significance Determination Process (SDP) in accordance with IMC 0609, "Significance Determination Process," Attachment 0609.04, "Phase 1 - Initial Screening and Characterization of findings," Table 4a for the Mitigating Systems Cornerstone. The finding screened as having very low safety significance (Green) because the finding was a design or qualification deficiency confirmed not to result in a loss of

operability at this time. This finding had a cross-cutting aspect in the area of human performance, decision making, because the licensee failed to use conservative assumptions in decision making. Specifically, the licensee made modifications to multiple safety related MOVs and then reestablished their design basis capability using methods that were inconsistent with industry and NRC guidance. [H.1(b)] (Section 4OA4.3.l(1))

Inspection Report# : [2011011](#) (pdf)

**G**

**Significance:** Oct 03, 2011

Identified By: NRC

Item Type: NCV NonCited Violation

**Inadequate functional evaluations performed to support operability of overthrust motor operated valves**

The inspectors identified an NCV of very low safety significance involving the licensee's failure to implement a procedure as required by 10 CFR 50 Appendix B, Criterion V, "Instructions, Procedures, and Drawings." The inspectors determined that TVA failed to implement the requirements of procedure NEPD-22, "Functional Evaluations," when the licensee's failed to verify the technical veracity and perform an adequate review, of multiple functional evaluations written to support operability of MOVs which experienced overthrust conditions.

The finding was determined to be more than minor because if left uncorrected, could become a more significant safety concern. Specifically, the review of the functional evaluation that is performed by the engineering supervisor is a critical part of the functional evaluation process to second check the quality of work that will ultimately be provided to the Senior Reactor Operator (SRO). The SRO will use this evaluation to aid in determining equipment operability. Therefore, the failure to thoroughly review Functional Evaluations and identify discrepancies could lead to incorrect information being used to determine equipment operability. The inspectors determined this finding was associated with the Mitigating Systems Cornerstone and characterized in accordance with IMC 0609, "Significance Determination Process," Attachment 0609.04, "Phase 1 - Initial Screening and Characterization of findings," Table 4a for the Mitigating Systems Cornerstone. The finding screened as having very low safety significance (Green) because the finding was a design or qualification deficiency confirmed not to result in a loss of operability at this time.

This finding has a cross-cutting aspect in the area of human performance, decision making, because the licensee did not make safety-significant or risk-significant decisions using a systematic process, especially when faced with uncertain or unexpected plant conditions, to ensure safety is maintained. Specifically, on multiple occasions, the engineering supervisor responsible for reviewing an engineering evaluation that was to be provided to the SRO for a degraded equipment condition failed to implement his/her role and authority in reviewing and approving functional evaluations. The Supervisors failed to provide the interdisciplinary review during the decision making process that should have identified that a Technical Update was not applicable to safety related valve actuators. [H.1(a)] (Section 4OA4.3.l(2))

Inspection Report# : [2011011](#) (pdf)

**Significance: TBD** Sep 30, 2011

Identified By: NRC

Item Type: NCV NonCited Violation

**Failure to properly install Unit 1 high pressure coolant injection booster pump outboard bearings**

A licensee-identified apparent violation of Technical Specifications 5.4.1.a was identified for the licensee failing to establish an adequate maintenance instruction for properly installing the Unit 1 High Pressure Coolant Injection (HPCI) booster pump outboard bearing. On July 20, 2011, visual inspections confirmed the booster pump outboard bearing was installed incorrectly and exhibited severe damage. The licensee replaced the HPCI booster pump outboard bearing and the issue was entered into the licensee's corrective action program as problem evaluation reports (PER) 405165 and 408067.

The finding was determined to be greater than minor because it was associated with the Mitigating Systems Cornerstone attributes of Equipment Performance and Procedure Quality, and adversely affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). Specifically, the work package to replace the HPCI booster pump outboard bearing did not include sufficiently detailed instructions to ensure that the bearings were installed in the

correct back to back arrangement. Failure to correctly install the HPCI booster pump bearing resulted in severe bearing damage that would have eventually led to a failure of the Unit 1 HPCI pump. The significance of this finding was characterized using Inspector Manual Chapter (IMC) 609, Significance Determination Process (SDP), Attachment 04, Phase 1 - Initial Screening and Characterization of Findings, which did not screen as Green for the Mitigating Systems Cornerstone because it involved a loss of system safety function. A further characterization of the safety significance was then performed using IMC 609, Appendix A, Determining the Significance of Reactor Inspection Findings for At-Power Situations. The Phase 2 SDP of Appendix A determined the finding to be potentially greater than very low safety significance (Green) based on the Browns Ferry Phase 2 pre-solved table. Since this finding was potentially greater than Green it will necessitate a Phase 3 SDP to characterize the safety significance. Because the safety significance of this finding has not been finalized, it will be designated as To Be Determined (TBD). No crosscutting aspect was assigned because the incorrect bearing installation did not occur within the past three years, and therefore, was not reflective of current licensee performance. (Section 1R22)

Inspection Report# : [2011005](#) (pdf)

Inspection Report# : [2011004](#) (pdf)

R

**Significance:** Oct 23, 2010

Identified By: Self-Revealing

Item Type: VIO Violation

#### **RHR subsystem inoperable beyond the TS allowed outage time**

Browns Ferry Nuclear Plant Unit 1 Technical Specification (TS) LCO 3.5.1, Emergency Core Cooling System (ECCS) - Operating, requires, in part, that each ECCS injection/spray subsystem shall be operable in Modes 1, 2 and 3. Action statement Condition A states that with one low pressure ECCS injection/spray subsystem inoperable, restore the low pressure ECCS injection/spray subsystem to operable status within seven days. Action statement Condition B states that with the required action and associated completion time of Condition A not met, be in Mode 3 within 12 hours and in Mode 4 within 36 hours.

Contrary to the above, from March 13, 2009, to October 23, 2010, a Unit 1 low pressure ECCS injection/spray subsystem was inoperable while in Modes 1, 2 and 3, and the licensee failed to restore the subsystem to operable status within seven days, or complete Action statement Condition A and B within the required time. Specifically, the Unit 1 Residual Heat Removal Loop II subsystem was inoperable, because the licensee failed to maintain the Unit 1 outboard Low Pressure Coolant Injection (LPCI) valve 1-FCV-74-66 in an operable condition, which rendered a low pressure ECCS injection/spray subsystem (the RHR loop II subsystem) inoperable while Unit 1 was operating in Mode 1.

Inspection Report# : [2011008](#) (pdf)

G

**Significance:** Dec 31, 2011

Identified By: Self-Revealing

Item Type: FIN Finding

#### **Unit 1 TS 3.0.3 entry caused by the failure of RPS M-G set 1B**

A self-revealing finding (FIN) was identified for the licensee's failure to adequately evaluate historically high vibrations on the Unit 1 Reactor Protection System (RPS) Motor Generator (M-G) Set 1B. Consequently, the impact of high vibrations was not considered in the determination of an adequate preventive maintenance frequency to ensure proper wire and cable terminal tightness in the RPS M-G Set control panel. The failure to ensure proper wire and cable tightness resulted in a loss of all Technical Specifications required reactor coolant system (RCS) leak detection. The licensee replaced the voltage regulator and performed all required tightness checks on RPS M-G Set 1B. In addition, the licensee verified appropriate tightness checks were scheduled in the next component outage window for the remaining M-G sets, and initiated actions to increase the preventive maintenance (PM) frequency to every two years, perform a design review to relocate the control panel, and evaluate the vibration program alert limit evaluation

process. This issue was entered into the licensee's corrective action program as problem evaluation report (PER) 412934.

The finding was determined to be more than minor because it was associated with the Barrier Integrity Cornerstone attribute of RCS Equipment and Barrier Performance, and adversely affected the cornerstone objective to provide reasonable assurance that physical design barriers (reactor coolant system) protect the public from radionuclide releases caused by accidents or events. Specifically, the failure to ensure proper wire and cable tightness resulted in loose connectors and/or cable assemblies that caused the failure of the Unit 1 RPS M-G Set 1B which resulted in a loss of all Unit 1 RCS leakage detection systems and an unplanned power reduction on August 6, 2011. The significance of the finding was evaluated using Phase 1 of the SDP in accordance with the IMC 0609 Attachment 4, and was determined to be of very low safety significance (Green) because the finding did not represent a pressurized thermal shock, fuel barrier, or spent fuel pool issue.

The cause of this finding was directly related to the cross-cutting aspect of Long Term Plant Safety Through Proper Maintenance Practices in the Resources component of the Human Performance area, because the vibration issues associated with Unit 1 RPS M-G Set 1B had been a long-standing equipment issue that was not adequately addressed by the vibration program alert limit evaluation process [H.2(a)]. (Section 4OA3.2)  
Inspection Report# : [2011005](#) (pdf)

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## Emergency Preparedness

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## Occupational Radiation Safety

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## Public Radiation Safety

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**Significance:** G Jun 30, 2012

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

### Failure to properly prepare a DOT type A package for transport

A self-revealing non-cited violation (NCV) of 10 CFR 71.5, Transportation of Licensed Material, was identified by inspectors for the licensee's failure to comply with Department of Transportation (DOT) regulations during shipment of radioactive materials. Specifically, the licensee failed to ensure proper packaging of two DOT 7A Type A packages as required by Department of Transportation (DOT) regulations in 49 CFR 173.475, Quality Control Requirements Prior To Each Shipment Of Class 7 (Radioactive) Materials. This issue has been entered into the licensee's corrective action program as SR 570902.

The finding was more than minor because it is associated with the Public Radiation Safety Cornerstone, Plant Facilities/Equipment and Instrumentation attribute, involving transportation packaging and adversely affected the cornerstone objective, to ensure adequate protection of public health and safety from exposure to radioactive materials released into the public domain as a result of routine civilian nuclear reactor operation. Specifically, the failure to correctly secure the package contents to prevent movement could have resulted in damage or failure of the container during transportation. The finding was determined to be of very low safety significance (Green) because it did not involve radiation limits being exceeded, a package breach, a certificate of compliance issue, a low-level burial ground non-conformance, or a failure to make emergency notifications. The cause of this finding was directly related to the cross cutting aspect of Documents, Procedures and Component Labeling in the Resources component of the Human Performance area because the licensee did not effectively incorporate package design specifications into their transportation program to ensure that all internal restraining devices are correctly installed to secure the CRDM in place to prevent damage to the transport package. (H.2(c)) (Section 2RS8)

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**Significance:** Jun 30, 2012

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

#### **Failure to implement DOT type A package closure requirements**

A self-revealing non-cited violation (NCV) of 10 CFR 71.5, Transportation of Licensed Material, was identified by inspectors for the licensee's failure to comply with Department of Transportation (DOT) regulations during shipment of radioactive materials. Specifically, the licensee failed to ensure proper packaging of two DOT 7A Type A packages as required by Department of Transportation (DOT) regulations in 49 CFR 173.475, Quality Control Requirements Prior To Each Shipment Of Class 7 (Radioactive) Materials. This issue has been entered into the licensee's corrective action program as SR 570902.

The finding was more than minor because it is associated with the Public Radiation Safety Cornerstone, Plant Facilities/Equipment and Instrumentation attribute, involving transportation packaging and adversely affected the cornerstone objective, to ensure adequate protection of public health and safety from exposure to radioactive materials released into the public domain as a result of routine civilian nuclear reactor operation. Specifically, the failure to correctly secure the package contents to prevent movement could have resulted in damage or failure of the container during transportation. The finding was determined to be of very low safety significance (Green) because it did not involve radiation limits being exceeded, a package breach, a certificate of compliance issue, a low-level burial ground non-conformance, or a failure to make emergency notifications. The cause of this finding was directly related to the cross cutting aspect of Documents, Procedures and Component Labeling in the Resources component of the Human Performance area because the licensee did not effectively incorporate package design specifications into their transportation program to ensure that all internal restraining devices are correctly installed to secure the CRDM in place to prevent damage to the transport package. (H.2(c)) (Section 2RS8)

## 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.

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## Miscellaneous

**Significance:** N/A Dec 31, 2011

Identified By: NRC

Item Type: NCV NonCited Violation

#### **Failure to report a valve motor operator manufacturing defect pursuant to 10 CFR 21.21 in a timely manner**

**Significance:** N/A Oct 03, 2011

Identified By: NRC

Item Type: VIO Violation

## **Inaccurate Information Provided Regarding Scoping of Motor Operated Valves in the Generic Letter 89-10 Program**

Inspection Report# : [2011011](#) (*pdf*)

Inspection Report# : [2012010](#) (*pdf*)

Last modified : September 12, 2012