

Browns Ferry 2

4Q/2012 Plant Inspection Findings

Initiating Events

Significance: G Jun 30, 2012

Identified By: Self-Revealing

Item Type: FIN Finding

Failure to establish preventive maintenance for Unit 2 and 3 main control room annunciator power supplies

A self-revealing finding (FIN) was identified for the licensee's failure to perform preventive maintenance on the Unit 3 Main Control Room (MCR) annunciator power supplies. As a result, a power supply failed which led to a fire in annunciator panel 3-X-55-5A in the Unit 3 control room. The licensee initiated actions to extinguish the fire, replace the two affected power supplies and develop a preventive maintenance program to replace the power supplies every ten years. Additional corrective actions to replace all power supplies that have been installed for more than four years are pending. This was captured in the licensee's corrective action program as problem event report (PER) 496592.

The performance deficiency 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 that resulted in a fire hazard in a safety-related area of the plant. The finding was associated with the Initiating Events Cornerstone and required a phase 3 analysis in accordance with IMC 0609 because the finding increased the likelihood of, and actually caused, a fire in the Unit 3 control room. The phase 3 analysis determined that without an impact to additional plant equipment, or a major impact on human action failure rates, the finding was determined to be Green. The cause of this finding was related to the cross cutting aspect of Problem Identification in the Corrective Action Program component of the Problem Identification and Resolution area because the licensee should have recognized the electrolytic capacitors were installed beyond their recommended service life and scheduled replacement prior to their failure [P.1(a)]. (Section 4OA3.6)

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

Significance: G 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)

Mitigating Systems

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)

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 being tracked or

monitored to ensure completion. [H.4(c)] (Section 40A2.a(3))

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

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 40A2.a(3))

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

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 40A2.e(2))

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

Significance: **G** 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 40A2.e(2))

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

Significance: **W** May 14, 2012

Identified By: NRC

Item Type: VIO Violation

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

During an NRC inspection completed on March 1, 2012, a violation of NRC requirements was identified. In accordance with the NRC Enforcement Policy, the violation is listed below:

10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," requires, in part, that activities affecting quality shall be prescribed by documented procedures of a type appropriate to the circumstances and shall be accomplished in accordance with these procedures. NPG-SPP-09.3, "Plant Modifications and Engineering Change Control," and form NPG-SPP-09.3-13, Modification Training Notification, requires an evaluation of training needs to be completed for the implementation of procedures developed in response to design changes. Procedures 0-SSI-25-1,-2,-3, and -26, "Safe Shutdown Instructions", were developed in support of Design Change Notice (DCN) 69957, which installed a new three-hour fire barrier in the Intake Tunnel Structure, per NPG-SPP-09.3. DCN 69957 was designated as an activity that affected quality.

Contrary to the above, the licensee failed to adequately accomplish the requirements contained in procedure NPG-SPP-09.3 "Plant Modifications and Engineering Change Control" during the implementation of DCN 69957. Specifically, on September 13, 2011, the licensee implemented Procedures 0-SSI-25-1,-2,-3, and -26, "Safe Shutdown Instructions," in support of DCN 69957 without adequately performing an evaluation of training needs. As a result, the systems approach to training was not properly implemented and the procedures could not be satisfactorily performed by plant operators and staff.

Inspection Report# : [2012013](#) (pdf)

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

Significance: **G** 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*)

Barrier Integrity

Significance:  Mar 31, 2012

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to ensure ECCS design calculation does not exceed maximum clad temperature

The NRC identified a Green non-cited violation of 10CFR 50.46, Acceptance criteria for emergency core cooling systems for light-water nuclear power reactors, for the licensee's failure to ensure that the ECCS was satisfactorily designed such that the maximum fuel element cladding temperature specified in 10 CFR 50.46(b)(1) would not be exceeded. On May 29, 2011, operating limitations were implemented to account for the error in calculations. This violation has been entered into the licensee's CAP as PER 372764.

This performance deficiency was considered greater than minor because it was associated with the Design Control attribute of the Barrier Integrity Cornerstone and adversely affected the cornerstone objective of providing reasonable assurance that the physical design barriers protect the public from radionuclide releases caused by accidents. The inspectors determined the finding to not be greater than green based on the remaining barriers to fission product release were unaffected. The cause of this finding was directly related to the cross-cutting aspect of Issue Identification in the Corrective Action Program component of the Problem Identification and Resolution area because the licensee failed to completely, accurately, and in a timely manner identify the errors with the ECCS evaluation model [P.1.(a)]. (4OA5.3)

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

Emergency Preparedness

Significance:  Sep 30, 2012

Identified By: NRC

Item Type: NCV NonCited Violation

Loss of seismic monitoring capability

The inspectors identified a non-cited violation (NCV) of 10 CFR 50.54(q)(2) for the licensee's failure to follow and maintain an emergency plan that meets the requirements of emergency planning standard 10 CFR 50.47(b)(4). Specifically, due to a plant modification, the licensee failed to maintain configuration control of seismic instrumentation necessary for the declaration of emergency events from August 17 to August 31, 2012. Completion of installation of the power and instrumentation logic signal to the control room annunciators on August 31, 2012, restored compliance with the emergency plan requirements. The licensee entered this issue into their corrective action program as PER 610625.

This finding was determined to be more than minor because it was associated with the Emergency Response Organization (ERO) Performance Attribute of the Emergency Preparedness Cornerstone and affected the cornerstone objective of ensuring the licensee is capable of implementing adequate measures to protect the health and safety of the public in the event of a radiological emergency. Specifically, one Alert and one Notification of Unusual Event Emergency Action Level (EAL) initiating condition would have been rendered ineffective such that a seismic event may not have been appropriately declared. The significance of this finding was evaluated in accordance with the IMC 0609, Appendix B, "Emergency Preparedness Significance Determination Process," and was determined to be of very low safety significance because an ineffective or degraded EAL scheme that affects Alert declarations was categorized as a Green violation. 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. Specifically, a lack of complete, accurate and up-to-date design documentation resulted in a loss of configuration control and degradation of information necessary to classify a seismic event. [H.2(c)], (Section 40A2.4)

Inspection Report# : [2012004](#) (*pdf*)

Occupational Radiation Safety

Public Radiation Safety

Significance:  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)

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

Significance: G 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)

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

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.

Miscellaneous

Significance: N/A Mar 31, 2012

Identified By: NRC

Item Type: NCV NonCited Violation

Repeated failure to report ECCS analyses methodology change or errors

The NRC identified a SL-IV NCV of 10 CFR 50.46, Acceptance criteria for emergency core cooling systems for light-water nuclear power reactors, for the licensee's failure to report a significant error discovered in their application of the ECCS model that affected the peak cladding temperature calculation.

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