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Browns Ferry 1 – Quarterly Plant Inspection Findings

2Q/2017 – Plant Inspection Findings

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Initiating Events

Significance:  Sep 30, 2016

Identified By: Self-Revealing

Item Type: NCV Non-Cited Violation

Failure to Maintain the High Pressure Fire Protection System Piping

A self-revealing Non-cited Violation (NCV) of Technical Specification (TS) 5.4.1.d, Fire Protection Program Implementation, was identified for the licensee's failure to maintain the integrity of the high pressure fire protection piping. The licensee's immediate corrective action was to isolate the leak and entered this issue into their corrective action program as CR 1102016.

This performance deficiency was more than minor because it adversely affected the Initiating Events cornerstone objective of protection against external factors such as fire. Specifically, the high pressure fire protection system piping was unable to maintain the required pressure during a system demand. This finding was evaluated in accordance with NRC IMC 0609, Appendix F, Fire Protection Significance Determination Process, dated September 20, 2013. The inspectors determined the finding was Green because the finding did not affect the reactor's ability to reach and maintain the fuel in a safe and stable condition. The inspectors assigned a cross cutting aspect of Operating Experience because there was a similar occurrence of a fire protection piping break at Browns Ferry caused by heavy construction vehicle traffic in 2014 (P.5).

Inspection Report# : 2016003 ([pdf](#))

Mitigating Systems

Significance:  Mar 31, 2017

Identified By: NRC

Item Type: NCV Non-Cited Violation

Incorrect Tap Settings for 480 Volt Shutdown Transformer Results in Inoperability of Associated 480V Shutdown Boards

An NRC identified non-cited violation of 10 CFR Part 50, Appendix B, Criterion VI, "Document Control," was identified after maintenance on safety related 4kv to 480 volt transformers TS1A and TS1B (Unit 1) resulted in the windings tap setting being misconfigured. The licensee's failure to develop work instructions to change TS1A and TS1B transformer configuration was a performance deficiency. This performance deficiency was more than minor because it impacted the Mitigating Systems cornerstone attribute of configuration control in that the loads supplied by 480 volt Shutdown Boards 1A and 1B were challenged by this misconfiguration. The finding screened as Green because the electrical system remained operable. The licensee entered the condition into their corrective action plan as CR 1221265 and corrected the tap setting. The finding was not assigned a crosscutting aspect because the cause was not related to current licensee performance.

Inspection Report# : 2017001 (*pdf*)

Significance:  Sep 30, 2016

Identified By: NRC

Item Type: NCV Non-Cited Violation

Inadequate Prompt Determination of Operability for HPCI Steam Line Inboard Isolation Valve

An NRC identified NCV of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action" was identified for the licensee's failure to promptly identify conditions adverse to quality associated with the prompt determination of operability (PDO) for CR 1061051. As an immediate corrective action, the licensee entered the violation into the licensee's corrective action program as CR 1193943. The performance deficiency was more-than-minor because it was associated with the Human Performance attribute of the Mitigating Systems cornerstone 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, had the deficiencies in the PDO been identified, engineers would have recognized that the resulting stresses exceeded allowable design stresses in the valve vendor's weak link analysis and approached the yield strength of the stem material. As a result, the practice was permitted to continue until the valve stem catastrophically failed. This finding was evaluated in accordance with NRC IMC 0609, Appendix A, Exhibit 2, Mitigating Systems Screening Questions, dated June 19, 2012. The inspectors determined the finding required a detailed risk evaluation because the finding represented a loss of system function and/or function for the high pressure coolant injection (HPCI) system. Senior Reactor Analyst performed a detailed risk evaluation using the Standardized Plant Analysis Risk (SPAR) model for Browns Ferry Unit 1. The HPCI system was modeled as unavailable for a conservative exposure period of 7 days. The delta CDF estimate was less than 1E-6/yr range, which represents a finding of very low safety significance (Green). The dominant core damage sequence was an inadvertent open relief valve, failure of HPCI, and failure to depressurize. The availability of additional injection sources helped minimize the risk significance. The inspectors determined that the finding had a cross-cutting aspect in the Design Margins area of the Human Performance aspect (H.6), because engineers did not demonstrate the behavior of carefully guarding margins to ensure that safety related equipment was operated and maintained within design margins.

Inspection Report# : 2016003 (*pdf*)

Significance:  Aug 12, 2016

Identified By: NRC

Item Type: NCV Non-Cited Violation

Failure to Identify and Evaluate All Targets Within the Zone of Influence of Ignition Sources

The NRC identified a violation of 10 CFR 50.48(c) for the licensee's failure to address in the Fire Probabilistic Risk Assessment (Fire PRA) the risk contribution associated with all potentially risk significant fire scenarios for a given fire compartment/fire area. The licensee did not identify and evaluate all targets that were within the zone of influence (ZOI) of ignition sources for selected fire scenarios that could potentially contribute to the risk for the fire scenarios. The licensee entered the issue in the corrective action program (CAP) as Condition Reports (CRs) 1195603 and 1197392. The affected area was already covered by

an hourly roving fire watch as a compensatory measure.

The licensee's failure to address the risk contribution associated with all potentially risksignificant fire scenarios, as required by section 2.4.3.2 of NFPA 805, was a performance deficiency. For each example, the performance deficiency was determined to be more than minor because it was associated with the reactor safety mitigating systems cornerstone attribute of protection against external factors (i.e., fire) and it adversely affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the licensee failed to analyze the full risk impact of the selected fire scenarios, and the missed targets in the ZOI for the selected fire scenarios had the potential to impact the ability to achieve safe and stable conditions. Using IMC 0609, Appendix F, Attachment 1, "Fire Protection Significance Determination Process Worksheet," the finding was screened as Green in step 1.6.1 "Screen by Licensee PRA-Based Safety Evaluation." There was no cross cutting aspect assigned to this finding because it was not indicative of current licensee performance since the original ignition source and target walkdowns were performed more than 3 years ago.

Inspection Report# : 2016011 (*pdf*)

Significance:  Aug 12, 2016

Identified By: NRC

Item Type: NCV Non-Cited Violation

Failure to Adequately Identify and Evaluate All Circuit Failures for NSCA Credited Equipment

The NRC identified a violation of 10 CFR 50.48(c) for the licensee's failure to properly identify circuits required for the nuclear safety function. Specifically, the licensee's Nuclear Safety Capability Assessment (NSCA) failed to identify that fire-induced failure of cables associated with the undervoltage trip function of the 4KV Shutdown Board could cause the shutdown board to not shed loads upon an undervoltage condition. This could lead to overloading the emergency diesel generator (EDG) credited for powering the shutdown board. This item was entered into the CAP as CR 1199002. The affected area was already covered by an hourly roving fire watch as a compensatory measure. Additionally, the licensee submitted EN 52150 to the NRC, documenting this as an unanalyzed condition.

The licensee's failure to identify circuits required for the nuclear safety function, as required by Section 2.4.2.2.1 of NFPA 805 was a PD. The PD was determined to be more than minor because it was associated with the reactor safety mitigating systems cornerstone attribute of protection against external factors (i.e., fire) and it adversely affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the licensee's failure to analyze the effects of fire damage on the 4kV shutdown bus undervoltage circuitry could result in overloading the emergency diesel generator (EDG) credited for powering the shutdown board. Using the guidance of IMC 0609, App. F, the finding was screened as Green because the risk increase associated with the finding was an increase of core damage frequency of <math><1E-6</math>/year. There was no cross cutting aspect assigned to this finding because it was not indicative of current licensee performance since the original ignition source and target walkdowns were performed more than 3 years ago.

Inspection Report# : 2016011 (*pdf*)

Significance:  Jul 31, 2016

Identified By: NRC

Item Type: NCV Non-Cited Violation

Inadequate Reassembly Procedure for HPCI Steam Line Inboard Isolation Valve Actuator

A self-revealing non-cited violation (NCV) of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings " was identified for the licensee's failure to provide sufficient detail, in this case, appropriate to the work activity in procedure, MCI-0-000-ACT004, Maintenance of SMB-0 through SMB-4T Limitorque Actuators, which impacted the design features of HPCI valve 1-FCV-73-2. As an immediate corrective action, the valve was repaired and corrective actions initiated to address the quality and details of motor operated valve procedures. The licensee entered the violation into their corrective action program as Condition Reports (CRs) 1228056 and 1229289. The performance deficiency was more than minor because it was associated with the Equipment Performance attribute of the Mitigating Systems cornerstone 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 reliability of the valve was reduced due to the impending worm gear teeth failure. While the valve was full open, the High Pressure Coolant Injection (HPCI) pump was able to fulfill its safety function of injecting water into the reactor. Since the valve was able to close upon entering outage U1R11, the HPCI system was able to isolate the HPCI steam supply line in the event of a HPCI steam line break. This finding was evaluated in accordance with NRC IMC 0609, Appendix A, Mitigating Systems Screening Questions. The inspectors determined the finding screened to Green as HPCI was not unavailable longer than its TS allowed outage time and the finding did not involve the loss or degradation of equipment designed to mitigate a seismic, flooding, or severe weather initiating event. The inspectors determined that the finding had a cross-cutting aspect of Procedure Adherence in the Human Performance area [H.8], because individual staff members did not review procedure and instructions prior to work to validate they were appropriate for the scope of work.

Inspection Report# : 2016004 (*pdf*)

Barrier Integrity

Emergency Preparedness

Occupational Radiation Safety

Significance:  Mar 31, 2017

Identified By: NRC

Item Type: NCV Non-Cited Violation

Unauthorized Entry into a High Radiation Area

. A self-revealing non-cited violation (NCV) of TS 5.7.1 was identified for a worker who entered a High Radiation Area (HRA) (Unit 1 reactor building steam tunnel) without proper authorization. This performance deficiency was determined to be greater than minor because it was associated with the Occupational Radiation Safety Cornerstone attribute of Human Performance and adversely affected the cornerstone objective of ensuring adequate protection of worker health and safety from exposure to radiation from radioactive material during routine civilian nuclear reactor operation. The inspectors determined the finding to be of very low safety significance (Green). The licensee entered the issue into their Corrective Action Program (CAP) as Condition Report (CR) 1219539, and took immediate corrective actions including restricting Radiologically Controlled Area (RCA) access for the individuals involved and performing confirmatory surveys of the area. This finding involved the cross-cutting aspect of Human Performance, Teamwork, [H.4], because a significant contributor to this event was poor communication between different work groups (workers entering the reactor building steam tunnel and RP personnel at the control)

Inspection Report# : 2017001 (*pdf*)

Significance:  Mar 31, 2017

Identified By: NRC

Item Type: NCV Non-Cited Violation

Failure to Perform Airborne Radioactivity Surveys

An inspector-identified non-cited violation (NCV) of TS 5.4.1 was identified for the licensee's failure to obtain an air sample while performing work in an area with smearable contamination levels greater than 50,000 disintegrations per minute (DPM) per 100cm². This performance deficiency was determined to be greater than minor because it was associated with the Occupational Radiation Safety Cornerstone attribute of Human Performance and adversely affected the cornerstone objective of ensuring adequate protection of worker health and safety from exposure to radiation from radioactive material during routine civilian nuclear reactor operation. The inspectors determined the finding to be of very low safety significance (Green). The licensee entered the issue into their CAP (CR 1219539) and, since the work created airborne radioactivity in the area, performed in-vivo monitoring on the affected workers to assess doses from the intake of radioactive material. This finding involved the cross-cutting aspect of Human Performance, Avoid Complacency, [H.12], because, considering the contamination levels present, RP staff underestimated the risk for potential airborne radioactive material in the area

Inspection Report# : 2017001 (*pdf*)

Public Radiation Safety Security

The security cornerstone is an important component of the ROP, which includes various security inspection activities the NRC uses to verify licensee compliance with Commission regulations and thus ensure public health and safety. The Commission determined in the staff requirements memorandum (SRM) for SECY-04-0191, "Withholding Sensitive Unclassified Information Concerning Nuclear Power Reactors from Public Disclosure," dated November 9, 2004, that specific information related to findings and performance indicators associated with the security cornerstone will not be publicly available to ensure that security-related information is not provided to a possible adversary. Security inspection report cover letters will be available on the NRC Web site; however, security-related information on the details of inspection finding(s) will not be displayed.

Miscellaneous

Current data as of : August 03, 2017

Page Last Reviewed/Updated Wednesday, August 10, 2016