Browns Ferry 2
4Q/2011 Plant Inspection Findings

Initiating Events

Significance: G Mar 31, 2011
Identified By: Self-Revealing
Item Type: NCV NonCited Violation
Loss of reactor water level during Unit 2 reactor reassembly due to a mispositioned valve
A self-revealing non-cited violation of Technical Specifications (TS) 5.4.1.a was identified for the licensee's failure to adequately implement operations instruction 2-OI-74, Residual Heat Removal System, to ensure the reactor cavity draindown flow path was isolated prior to suppression pool draindown. On March 25, 2011, Operations personnel inadvertently left a Residual Heat Removal (RHR) system drain valve in the open position which led to an uncontrolled draindown of the reactor pressure vessel (RPV) coolant to the suppression pool. Operators immediately identified the RPV level decrease and restored the valve lineup and water level. The licensee's immediate corrective actions re-emphasized adherence to log keeping and turnover requirements; instituted shift manager challenges on activities that impact key safety functions including assessments of procedures, plant configuration, turnover information, and pre-job briefs of personnel roles and responsibilities; and, for those same activities, instituted peer checks, marked up drawings, and supervisory review of completed field copies of procedures. This issue was entered into the licensee's corrective action program as problem evaluation report (PER) 344533.

This finding was considered more than minor because it was associated with the Human Performance attribute of the Initiating Events Cornerstone 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, a mispositioned RHR drain valve resulted in a loss of control of the RPV water level. This finding was determined to be of very low safety significance (Green) according to Inspection Manual Chapter (IMC) 0609, Appendix G, Shutdown Operations, because the inadvertent loss in excess of 2 feet (approximately 40 inches) of reactor coolant inventory represented a loss of inventory control. Using IMC 0609, Appendix G, Attachment 3, "Phase 2 Significance Determination Process Template for BWR During Shutdown," a Senior Reactor Analyst performed an analysis and determined the loss of inventory event was
of very low risk significance (Green) due in part to automatic functions being available to isolate and mitigate the leak had it continued and remained undetected/uncorrected by the operators. The cause of this finding was directly related to the cross-cutting aspect of Work Activity Coordination in the Work Control component of the Human Performance area, because inadequate documentation and communication of plant system configuration by the control room operators resulted in a mispositioned valve and loss of RPV water level [H.3.(b)]. (Section 1R20.1)
Inspection Report# : 2011002 *(pdf)*

Mitigating Systems

Significance: G Jun 30, 2011
Identified By: Self-Revealing
Item Type: NCV NonCited Violation
Failure to take corrective actions to preclude a repetitive functional failure of an EDG due to excessive heat exchanger fouling
A self-revealing non-cited violation of 10 CFR 50, Appendix B, Criterion XVI, Corrective Action, was identified for the licensee's failure to take prompt corrective actions to preclude repetition of a significant condition adverse to quality (SCAQ) that resulted in the loss of a emergency diesel generator (EDG) safety function due to excessive heat exchanger fouling. On August 4, 2010 the licensee identified a SCAQ due to excessive fouling of the Unit 1/2 D EDG heat exchangers which resulted in a functional failure of the D EDG. Prompt corrective actions were not taken to

preclude repetition because on June 5, 2011, excessive fouling was identified on the 3D EDG heat exchangers which resulted in a functional failure of the 3D EDG. Corrective actions taken by the licensee included cleaning and returning the 3D EDG heat exchangers to an operable status, and increasing monitoring of emergency equipment cooling water (EECW) cooling flow to all the EDG heat exchangers from weekly to every two days. The licensee entered this issue into their corrective action program as problem evaluation report (PER) 381569.

This finding was determined to be more than minor because it was associated with the Mitigating Systems Cornerstone attribute of Equipment Performance, 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 excessive fouling of the 3D EDG heat exchanger was a functional failure and resulted in unplanned unavailability of the 3D EDG. In accordance with Inspection Manual Chapter (IMC) 0609 Attachment 4, Phase I - Initial Screening and Characterization of Findings, this finding was determined to be of very low safety significance because it did not represent an actual loss of safety function of a single train for more than its technical specification allowed outage time of seven days, or screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event. The cause of this finding was directly related to the cross-cutting aspect of Maintaining Long Term Plant Safety (Equipment Issues) in the Resources component of the Human Performance area because of the licensee's failure to minimize the duration of a long-standing degraded equipment issue related to relic clam shells in the EECW system which resulted in a repetitive functional failure of an EDG due to excessive heat exchanger fouling. [H.2.(a)]. (Section 1R07)
Inspection Report# : 2011003 *(pdf)*

Barrier Integrity

Significance: G Mar 31, 2011
Identified By: NRC
Item Type: NCV NonCited Violation
Inadequate TS 5.5.2 program for primary coolant leaks outside containment
An NRC identified non-cited violation of Technical Specifications (TS) 5.5.2, Primary Coolant Sources Outside Containment was identified for the licensee's failure to establish, implement, and maintain an adequate program for minimizing primary coolant leaks from systems (i.e., Core Spray, Residual Heat Removal, High Pressure Coolant Injection, and Reactor Core Isolation Cooling) outside containment, that could contain highly radioactive fluids during a serious transient or accident, to levels as low as practicable. The licensee's corrective actions included identification, evaluation, and prioritization of all known primary coolant leaks outside containment; and development of a new program in accordance with 0-TI-578, Minimizing Primary Coolant Sources Outside Containment. This finding was entered into the licensee's corrective action program as problem evaluation report (PER) 317464.

This finding was determined to be more than minor because if left uncorrected it could have led to a more significant safety concern. Specifically, the licensee's failure to effectively minimize and monitor primary coolant leakage outside containment could have resulted in increased main control room exposure and/or offsite dose during an accident due to excessive radioactive fission product releases into secondary containment. The finding was determined to be of very low safety significance (Green) according to IMC 0609, Appendix H, Containment Integrity Significance Determination Process, Section 6.0, Type B Findings, because the primary coolant leak rate into secondary containment was a small fraction of the leakage assumed in the design basis accident (DBA) safety analyses. The cause of this finding was directly related to the cross-cutting aspect Complete and Accurate Procedures in the Resources component of the Human Performance area because the licensee's existing procedures were inadequate and incomplete for addressing the program requirements of TS 5.5.2 [H.2.(c)]. (Section 4OA2.5)

Inspection Report# : 2011002 *(pdf)*

Emergency Preparedness

Occupational Radiation Safety

Public Radiation Safety

Physical Protection

Although the NRC is actively overseeing the Security cornerstone, the Commission has decided that certain findings pertaining to security cornerstone will not be publicly available to ensure that potentially useful information is not provided to a possible adversary. Therefore, the cover letters to security inspection reports may be viewed.

Miscellaneous

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