

Duane Arnold

2Q/2009 Plant Inspection Findings

Initiating Events

Significance:  Jun 30, 2009

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

INADEQUATE SURVEILLANCE TEST PROCEDURE REVISION RESULTS IN A PLANT SCRAM.

A finding of very low safety significance and associated NCV of 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," was self-revealed when Instrument and Controls (I&C) Technicians lifted a lead on a reactor water level recorder resulting in the indicated reactor water level failing low and an actual increase in reactor water level. This plant transient resulted in operators inserting a manual reactor scram to mitigate the transient condition. The inspectors determined that the failure of I&C Technicians and Procedure Writers to include adequate procedural guidance in the Surveillance Test Procedure (STP) was contrary to the requirements of 10 CFR 50, Appendix B, Criterion V, and was therefore a performance deficiency. The licensee entered this into their corrective action program as CAP 066292. The reactor operators completed the required actions for a reactor scram and placed the plant in a stable condition. The STP was revised to include appropriate guidance to remove the reactor level recorder from service, and an extent of condition review was performed for other Refueling Outage 21 modifications that could result in plant trips or downpowers if similar conditions existed.

The performance deficiency was determined to be more than minor because the issue was associated with the Initiating Events Cornerstone attribute of procedure quality and affected the cornerstone objective of limiting the likelihood of those events that upset plant stability and challenge critical safety functions during power operations. Specifically, I&C Technicians and Procedure Writers made an inadequate change to the STP that resulted in a plant transient that led to a reactor scram. The inspectors determined the finding was of very low safety significance (Green) because the finding only resulted in a reactor scram and did not contribute to the likelihood that mitigation equipment or functions would not be available. This finding has a cross-cutting aspect in the area of Human Performance, Resources, because the licensee did not ensure procedures were adequate to assure nuclear safety. Specifically, the inadequate change to the Reactor Water Level and Pressure Instrument Calibration STP resulted in an inaccurate procedure that caused a plant transient resulting in a reactor scram.

Inspection Report# : [2009003](#) (*pdf*)

Significance:  Mar 31, 2009

Identified By: Self-Revealing

Item Type: FIN Finding

COOLING TOWER RISER BREAK LEADS TO MANUAL REACTOR SCRAM.

A finding of very low safety significance was self revealed when the Operators exceeded the operational limit of the cooling tower riser by failing to secure one of the two running circulating water pumps prior to securing flow to the 'A' cooling tower. The inspectors determined that the Operators exceeding the operational limit of the 'B' cooling tower west riser was contrary to the guidance for safe operation of plant equipment contained in Administrative Control Procedure (ACP) 110.1, "Conduct of Operations," and therefore was a performance deficiency. No violation of regulatory requirements occurred. The licensee entered this issue into their corrective action program (CAP) as CAP 063426. The 'B' cooling tower riser was repaired, structural support was added to all four cooling tower risers, and operating procedures were revised to preclude operators from operating two circulating water pumps with only one cooling tower in operation.

The finding was determined to be more than minor because the finding was associated with the reactor safety cornerstone attribute of procedure quality and affected the cornerstone objective of limiting the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown. Specifically, operating the plant in an inappropriate configuration resulted in the loss of the normal plant heat sink, which required the operators

to manually scram the reactor and rely on safety related equipment to cool the plant down. The inspectors determined the finding was of very low safety significance (Green) because the finding only resulted in a reactor scram and did not contribute to the likelihood that mitigation equipment or functions would not be available. This finding has a cross-cutting aspect in the area of Problem Identification and Resolution, Corrective Action, because the licensee did not take appropriate corrective actions to address safety issues and adverse trends in a timely manner. Specifically, maintenance and operations personnel failed to adequately address a known deficiency with a plugged pressure transmitter, which resulted in the control room allowing throttling of the 'A' cooling tower riser valves until they were fully shut, thus exceeding the operational limit of the cooling tower.

Inspection Report# : [2009002](#) (*pdf*)

Mitigating Systems

Significance:  Jun 30, 2009

Identified By: NRC

Item Type: NCV NonCited Violation

FAILURE TO PROMPTLY IDENTIFY AND CORRECT A NONCONFORMING CONDITION ON A HPCI SUPPRESSION POOL SUCTION LINE SEISMIC RESTRAINT.

A finding of very low safety significance and associated NCV of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," was identified by the inspectors for a failure of the licensee to promptly identify and correct a condition adverse to quality (CAQ) associated with a seismic restraint on the High Pressure Coolant Injection (HPCI) Suppression Pool suction line. The licensee's failure to promptly identify and correct the nonconforming condition during engineering walkdowns of the HPCI system was considered a performance deficiency. The licensee entered this issue into the Corrective Action Program (CAP) as items CAP 066713 and CAP 066750, declared the HPCI system inoperable, and isolated the HPCI Suppression Pool suction line. The seismic restraint was repaired to return it to a fully operable condition.

The performance deficiency was determined to be more than minor because the issue was associated with the Mitigating Systems Cornerstone attribute for protection against external events and affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesired consequences. The inspectors evaluated this finding using the SDP and determined the finding was of very low safety significance (Green) because this finding was a design deficiency that did not result in a loss of operability of the HPCI System. The inspectors also determined that this finding had a cross-cutting aspect in the area of Problem Identification and Resolution, Corrective Action Program, because the licensee did not promptly identify an adverse condition in the CAP in a timely manner commensurate with its safety significance.

Inspection Report# : [2009003](#) (*pdf*)

Significance:  May 22, 2009

Identified By: NRC

Item Type: NCV NonCited Violation

FAILURE TO PROMPTLY IDENTIFY AND EVALUATE THE DEGRADED CONDITION ASSOCIATED WITH THE 'D' RWS PUMP MOUNTING BASE BOLTED CONNECTORS.

A finding of very low safety significance and associated non-cited violation of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," was identified by the inspectors for a failure of the licensee to promptly identify and correct a condition adverse to quality (CAQ) associated with the 'D' river water supply (RWS) pump mounting base bolted connectors. The licensee's failure to evaluate the operability of the 'D' RWS pump due to the degraded bolting was considered a performance deficiency. By not examining the thread degradation documented on the overtorqued 'D' RWS pump mounting base bolted connectors, the licensee was unable to adequately identify the as-left condition of the stud threads, evaluate the impact that condition had on the seismic qualification of the pump, and implement appropriate corrective actions to resolve the degraded condition. The failure to promptly identify and correct a CAQ associated with the safety-related 'D' RWS pump was a violation of NRC requirements specified in 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action." The licensee entered this issue into the Corrective Action Program (CAP Item 067412), examined the pump mounting connectors, and initiated a prompt operability determination to

evaluate the seismic qualification. Based on this evaluation, the 'D' RWS pump was declared Operable but degraded.

The performance deficiency was determined to be more than minor because the issue 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. The inspectors evaluated this finding using the Significance Determination Process (SDP) and determined the finding was of very low safety significance (Green) because this finding was a design or qualification deficiency that did not result in a loss of operability of the safety component. The inspectors also determined that this finding had a cross-cutting aspect in the area of Problem Identification and Resolution, Corrective Action Program, because the licensee did not promptly and completely identify an adverse condition in the CAP in a timely manner commensurate with its safety significance (P.1.a).

Inspection Report# : [2009007](#) (*pdf*)

Significance: **W** Apr 17, 2009

Identified By: NRC

Item Type: VIO Violation

FAILURE TO PROMPTLY IDENTIFY AND CORRECT A SIGNIFICANT CONDITION AVERSE TO QUALITY ASSOCIATED WITH THE 'B' EDG.

The inspectors identified a finding and associated apparent violation of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," associated with the licensee's failure to identify and correct the cause of 'B' EDG overspeed trip alarms, a condition documented in the licensee's corrective action program as being adverse to quality (CAP 055746), in February 2008. Following corrective actions in March 2008, to replace a faulty annunciator card, the spurious overspeed trip alarms began recurring in June 2008. By not performing additional evaluation to identify and correct the cause for the recurring spurious overspeed trip alarms, the conditions which allowed the overspeed switch degradation continued, which eventually resulted in the failure of the 'B' EDG during the monthly surveillance test conducted in November 2008. The licensee implemented corrective actions that included replacing the 'B' EDG overspeed microswitch, developing written instructions for installation and setup of the microswitch, inspecting the 'A' EDG overspeed switch for extent of condition, stopping the practice of resetting the EDG overspeed latch once per shift, repair of the overspeed electrical conduit support bracket, and revisions to the station's administrative control procedure for troubleshooting to require more rigorous troubleshooting activities for Priority 2 items.

The finding was determined to be more than minor because the reliability of the 'B' EDG is associated with the equipment performance attribute of the Mitigating Systems Cornerstone and adversely affects the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The finding associated with this apparent violation was assessed using a Phase 3 analysis in accordance with NRC Inspection Manual Chapter 0609 Appendix A, "Determining the Significance of Reactor Inspection Findings for At-Power Situations," and is preliminarily determined to have low to moderate safety significance (White).

The cause of this apparent violation was related to the Corrective Action Program Component for the cross-cutting area of Problem Identification and Resolution, because the licensee failed to thoroughly evaluate problems such that the resolutions address causes and extent of conditions [P.1(c)]. Specifically, the licensee failed to thoroughly evaluate and identify the cause of recurring 'B' EDG overspeed trip alarms. The recurring alarms started in February 2008, and periodically continued until the 'B' EDG output breaker tripped during a surveillance test on November 2, 2008.

Inspection Report# : [2009009](#) (*pdf*)

Inspection Report# : [2009011](#) (*pdf*)

Significance: **G** Mar 31, 2009

Identified By: NRC

Item Type: NCV NonCited Violation

FAILURE TO PERFORM REQUIRED ACTIONS FOR EXISTING LCO CONDITIONS DURING IN-VESEL FUEL MOVEMENTS.

A finding of very low safety significance and associated non-cited violation of Technical Specifications (TSs) was identified by the inspectors for the operators failing to perform required actions for existing limiting condition for operation (LCO) conditions, involving TS equipment declared inoperable, during in-vessel fuel movements. The inspectors determined that the failure to perform TS LCO required actions during in-vessel fuel movement was contrary to Refueling Operations TS required actions and therefore was a performance deficiency. The licensee entered this issue into their corrective action program as CAP 064489. The core alterations were suspended to comply with the TSs until the issue was resolved. Actions were taken to ensure that the control rods with the inoperable rod position indicators were fully inserted, and to electrically disarm the control rod drives. Once the required actions were completed, the fuel shuffle was recommenced.

The performance deficiency was determined to be more than minor because the finding was associated with the Mitigating Systems cornerstone attribute of human 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, when changes in plant conditions affect previously performed required actions for equipment declared inoperable, the failure to perform the TS LCO required actions for the new plant conditions, could lead to a more significant safety concern by unknowingly exceeding allowed outage times established for specific LCOs. This human error could, in turn, challenge mitigating systems' availability, reliability and capability to respond to initiating events. The inspectors determined that this finding only degraded the reactivity control function of the mitigating systems cornerstone, and only affected the safety of a reactor during refueling operations after the entry conditions had been met and shutdown cooling had been initiated. Using IMC 0609, Appendix G, "Shutdown Operations SDP," and Checklist 7, "BWR Refueling Operation with RCS Level > 23'," contained in Attachment 1, the inspectors determined that the finding did not require a quantitative assessment. Using Figure 1, this finding screened as very low safety significance (Green). The inspectors also determined that this finding has a cross-cutting aspect in the area of Human Performance, Decision Making, because the licensee did not adopt a requirement to demonstrate that the proposed action was safe in order to proceed rather than a requirement to demonstrate that it is unsafe in order to disapprove the action. Specifically, the requirements of RFP-403 and IPOI-8 to verify readiness to commence in-vessel fuel movements did not adequately provide for a review of inoperable TS equipment completed LCO actions to ensure core alteration TSs for reactivity control were met during the fuel movements.

Inspection Report# : [2009002](#) (*pdf*)

G

Significance: Sep 30, 2008

Identified By: NRC

Item Type: NCV NonCited Violation

INADEQUATE ASSESSMENT OF ECCS ROOM COOLER FAN MOTOR BEARING NONCONFORMING CONDITION.

A finding of very low safety significance and associated NCV of Technical Specification (TS) Section 5.4.1.a, associated with Regulatory Guide 1.33, Revision 2, Appendix A, Section 9, was identified by the inspectors when the licensee failed to adequately evaluate a condition adverse to quality prior to the maintenance activity's Environmental Qualification (EQ) Drop Dead Date (DDD). Specifically, the licensee failed to evaluate the Emergency Core Cooling System (ECCS) room cooler fan motors as operable but non-conforming prior to the EQ DDD as required by Duane Arnold's Preventive Maintenance Program procedure. The licensee entered this condition into their CAP as Corrective Action Process document 060543, and declared the equipment operable but non-conforming.

This issue is more than minor because the finding 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 undesired consequences. Specifically, the failure to correctly assess the ECCS room cooler fan motor bearings as nonconforming with their EQ calculation of record had the potential to impact the availability and reliability of the ECCS room coolers. The inspectors evaluated the finding using the 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. Because the finding was a qualification deficiency confirmed not to result in a loss of operability or functionality, the finding screened as Green. This finding has a cross-cutting aspect in the Problem Identification and Resolution (PI&R) component of CAP, because the licensee did not properly classify, prioritize, and evaluate for operability a condition adverse to quality [P.1(c)]. Specifically, the Engineering and Operations Departments failed to classify the ECCS

room cooler fan motors as operable but nonconforming.

Inspection Report# : [2008004](#) (pdf)

Significance:  Sep 30, 2008

Identified By: NRC

Item Type: NCV NonCited Violation

FAILURE TO PERFORM A TS SURVEILLANCE REQUIREMENT FOR THE HPCI SYSTEM WITHIN THE SPECIFIED FREQUENCY.

A finding of very low safety significance and associated NCV of 10 CFR 50 Appendix B, Criterion III, "Design Control" was identified by the inspectors for the licensee's failure to assure that applicable regulatory requirements and design basis were correctly translated into specifications, drawings, procedures and instructions. Specifically, following installation of a permanent modification to install a high pressure keep fill system for the high pressure coolant injection (HPCI) system discharge piping, the Surveillance Test Procedure (STP) implemented to document performance of Surveillance Requirement (SR) 3.5.1.1 for the HPCI system did not ensure that the minimum requirements for system operability were met. The licensee entered this issue into their CAP as CAP 060168, and invoked SR 3.0.3 to address the potentially missed SR.

The issue was more than minor because the finding was associated with the Mitigating Systems Cornerstone attribute of design control of permanent modifications and affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesired consequences. Specifically, the Operations department did not recognize that the implementation of the surveillance procedure which documented the performance of SR 3.5.1.1 for the HPCI system did not ensure that the minimum requirements for system operability were met and therefore had the potential to impact the availability and reliability of the HPCI system. The inspectors evaluated the finding using the 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. Because the finding does not represent an actual loss of safety function of a single train, and does not screen as risk significant due to an external initiating event, the finding was screened as very low safety significance (Green). The inspectors also determined that this finding had a cross-cutting aspect in the PI&R component of CAP, because the licensee did not properly classify, prioritize, and evaluate for operability a condition adverse to quality [P.1(c)]. Specifically, the Operations and Engineering Departments failed to recognize that the system conditions established during performance of STP 3.5.1-13 had the potential to preclude performance of the SR and allow the condition to go unrecognized.

Inspection Report# : [2008004](#) (pdf)

Barrier Integrity

Significance:  Mar 31, 2009

Identified By: NRC

Item Type: NCV NonCited Violation

FAILURE TO CONSIDER DESIGN BASIS LOAD IN EVALUATION FOR CONTINUED OPERATION.

A finding of very low safety significance and associated NCV of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," was identified by the inspectors for the failure to verify the adequacy of the methodology and design inputs used to support licensee decisions to accept non conforming systems, structures, and components for continued operation. The licensee entered this issue into its CAP and was able to demonstrate the Primary Containment system and piping subsystems attached to Drywell penetrations to be operable during design basis accident conditions.

The finding was determined to be more than minor because the omission of a design basis load in engineering evaluations used to justify continued operation resulted in a condition where there was reasonable doubt regarding the operability of the Primary Containment system and piping subsystems attached to Drywell penetrations during accident conditions. The inspectors determined the finding was of very low safety significance because it was a design

deficiency that did not result in actual loss of safety function. This finding did not have a cross-cutting aspect.

Inspection Report# : [2009002](#) (*pdf*)

Significance: **G** Dec 31, 2008

Identified By: NRC

Item Type: NCV NonCited Violation

HPCI STEAM EXHAUST VACUUM BREAKER PIPING CONFIGURATION NOT IN CONFORMANCE WITH PIPING DESIGN BASIS ANALYSIS OF RECORD.

A finding of very low safety significance and associated NCV of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," was identified by the inspector for the failure of the high pressure coolant injection vacuum breaker piping configuration to be in conformance with the piping design analysis of record. The licensee entered this issue into its corrective action program and was able to demonstrate the vacuum breaker piping to be operable during design basis accident conditions.

The finding was determined to be more than minor because the finding was similar to Inspection Manual Chapter 0612, Appendix E, Example 3a. Specifically, to restore conformance of the high pressure coolant injection vacuum breaker piping to the piping design basis analysis of record, a modification to the existing piping configuration is necessary. The inspector determined the finding was of very low safety significance because it was a design deficiency that did not result in actual loss of safety function. The inspector determined there was no cross cutting aspect associated with this finding.

Inspection Report# : [2008005](#) (*pdf*)

Significance: **SL-IV** Dec 31, 2008

Identified By: NRC

Item Type: NCV NonCited Violation

10 CFR 50.59 SAFETY EVALUATION NOT PERFORMED FOR CHANGE IN METHOD OF EVALUATION.

A finding of very low safety significance and associated NCV of 10 CFR Part 50.59, "Changes, Tests, and Experiments," was identified by the inspector for the licensee's failure to provide a documented basis that a change in the method of evaluation for small bore torus attached piping systems as defined in the Plant Unique Analysis Report for torus attached piping did not require prior NRC approval.

Because the issue affected the NRC's ability to perform its regulatory function, this issue was evaluated using the traditional enforcement process. The finding was determined to be more than minor because the inspector could not reasonably determine that the change would not have ultimately required NRC prior approval. The finding was determined to be of very low safety significance by the NRC's significance determination process because it was a design deficiency that did not result in actual loss of safety function. 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 to demonstrate that a proposed action is safe to proceed, in that, the licensee did neither verify the validity of their justification to not reevaluate the high pressure coolant injection steam exhaust vacuum breaker piping attached to the modified high pressure coolant injection steam exhaust piping nor identify adverse consequences due to changes in the high pressure coolant injection steam exhaust piping resonant frequency content [H.1(b)].

Inspection Report# : [2008005](#) (*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

Significance: N/A May 22, 2009

Identified By: NRC

Item Type: FIN Finding

PI&R Summary

Overall the corrective action program (CAP) program was adequate in that issues were identified at a low threshold, evaluated and corrected. Self-assessments and audits by Nuclear Oversight (NOS) were thorough and critical of the assessed areas. Operating experience was recognized as valuable, was appropriately evaluated, and was effectively communicated in daily plant meetings and pre-job briefings. Interviews with licensee staff and a review of the employee concerns program indicated that the licensee had a positive safety culture environment that encouraged identification of issues in the CAP.

However, the inspectors identified several areas of concern that prevented the CAP from being an effective tool for performance improvement. There were examples where licensee staff failed to demonstrate a challenging, questioning attitude during issue screening and evaluation, where identified program weaknesses or vulnerabilities were accepted without a strong desire for change, and where management expectations were not reinforced. For example:

- Ineffective trending has been a recurring issue since 2005, based on the results of NRC, industry and station assessments. However, fixing this problem does not appear to be a station priority. Although the pieces needed to have a successful program are largely in place, there does not appear to be a drive to actually implement the process.
- There were some examples of CAP issues that were inappropriately challenged either at the Initial Screening Team (IST), Management Review Committee (MRC) or both. The inspectors observed instances where IST and MRC members accepted issues without challenging the information given or considering the overall impact of the issue on the safety/risk function of the component or system.
- There was a tendency to perform myopic reviews focusing on the specific issue being evaluated and not on the underlying performance concern. Standards for performing cause evaluations were not being reinforced. There were several examples where the review of extent of condition, applicability of operating experience or the basis for the conclusion were either limited or not well documented. Although some of the issues were identified during the evaluation grading, there was no priority or impetus to change the incorrect behavior.

Inspection Report# : [2009007](#) (*pdf*)

Last modified : August 31, 2009