

Duane Arnold

3Q/2008 Plant Inspection Findings

Initiating Events

Significance:  Mar 31, 2008

Identified By: NRC

Item Type: NCV NonCited Violation

FAILURE TO PROPERLY ADMINISTER AND DOCUMENT OVERTIME LIMITS, REQUIREMENTS, AND DEVIATIONS.

A finding of very low safety significance, and an associated NCV of Technical Specification (TS) 5.2.2.e, Administrative Controls, Organization, Unit Staff, was identified by the inspectors for the licensee's failure to follow the Administrative Control Procedure (ACP) 101.4, "Overtime Limits and Requirements," Section 3.1 (3) requirement for assuring that personnel do not exceed the overtime requirements without prior authorization. The licensee entered this issue into its corrective action program to evaluate the adequacy and effectiveness of the ACP, and to identify required procedure revisions to prevent recurrence.

Using the minor questions in Appendix B of IMC 0609, the inspectors determined that the finding was more than minor because the issue was associated with the Initiating Events Cornerstone attribute of Human Performance and affected the cornerstone objective of limiting the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. Specifically, the unrecognized periods of excessive work hours would increase the likelihood of human errors during refueling outage activities and response to plant events, i.e. fire watches. Since these periods were unrecognized and not authorized in advance by management, the excessive work hours could result in more significant safety concerns. Because this issue occurred during the last refueling outage, the finding was evaluated in accordance with IMC 0609, Appendix G, "Shutdown Operations SDP." Using Checklist 7, "Boiling Water Reactor (BWR) Refueling Operation with RCS Level > 23'", contained in Attachment 1, the inspectors determined that since the plant had appropriately met the safety function guidelines for core heat removal, inventory control, power availability, containment integrity, and reactivity control, and since a phase 2 or phase 3 analysis was not required, the finding screened as Green using Figure 1.

This finding has a cross-cutting aspect in the area of Human Performance for the Resources safety culture component because the licensee did not ensure that sufficient trained personnel and procedures were available and adequate to assure nuclear safety by maintaining work hours within working hour limits.

Inspection Report# : [2008002](#) (*pdf*)

Mitigating Systems

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*)

G**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*)**G****Significance:** Mar 14, 2008

Identified By: NRC

Item Type: NCV NonCited Violation

Inadequate Calculations/Analyses for Essential 4160 VAC Circuit Breaker Close/Open Coils (1R21.3.b.(1))

A finding of very low safety significance (Green) and associated NCV of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," was identified by the inspectors for the failure to assure and verify that adequate control voltage was available for the close and open coils of the 4160VAC [volts alternating current] safety-related breakers. The licensee entered this performance deficiency into its corrective action program, performed a simplified evaluation to determine the worst case available close coil voltage at the worst case breaker fed from the 4160VAC essential switchgear, and conducted testing to demonstrate a reasonable assurance of operability. The finding was determined to be more than minor because the failure to assure and verify that adequate control voltage was available to close and open the 4160VAC breakers could have affected the capability of emergency diesel generators and other safety-related equipment to respond to initiating events. The issue was of very low safety significance because the inspectors determined it was a design deficiency that did not result in actual loss of safety function. The inspectors determined there was no cross-cutting aspect associated with this finding. (Section 1R21.3.b.(1))

Inspection Report# : [2008006](#) (*pdf*)**G****Significance:** Mar 14, 2008

Identified By: NRC

Item Type: NCV NonCited Violation

Inadequate Calculations/Analyses and Testing for TOLs on Safety-Related MOVs (1R21.3.b.(2))

A finding of very low safety significance (Green) and associated NCV of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," was identified by the inspectors for the failure to assure that thermal overload relays (TOLs) on safety-related motor-operated valve (MOV) circuits were sized properly and periodically tested. The licensee entered this issue into its corrective action program and was able to demonstrate operability in that the TOLs would not prevent any MOVs from performing their safety function. The finding was determined to be more than minor because the failure to assure that TOLs were properly sized and periodically tested could have affected the ability for MOVs to respond to initiating events. The issue was of very low safety significance because the inspectors determined it was a design deficiency that did not result in actual loss of safety function. The inspectors determined there was no cross-cutting aspect associated with this finding. (Section 1R21.3.b.(2))

Inspection Report# : [2008006](#) (*pdf*)**G****Significance:** Mar 14, 2008

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to Periodically Test Reactor Protection System Key Lock Bypass Switches (1R21.6.b.(1))

A finding of very low safety significance (Green) and associated NCV of 10 CFR Part 50, Appendix B, Criterion XI, "Test Control," was identified by the inspectors for the failure to test reactor protection system (RPS) key locked bypass switches. The licensee entered this issue into its corrective action program and initiated procedural changes to require periodic testing of the RPS bypass switches. This finding was more than minor because the licensee did not ensure the operability and functional performance of the key lock switches used bypass automatic protection circuits in the RPS. The issue was of very low safety significance because the inspectors determined that it did not result in actual loss of safety function. The inspectors determined there was no cross-cutting aspect associated with this finding. (Section 1R21.6.b. (1))

Inspection Report# : [2008006](#) (pdf)

Significance: SL-IV Dec 31, 2007

Identified By: NRC

Item Type: NCV NonCited Violation

FAILURE TO MAKE AN 8 HOUR NOTIFICATION TO THE NRC FOR LOSS OF BOTH EDGS.

A finding of very low safety significance and an associated Severity Level IV NCV of 10 CFR 50.72(b)(3)(v) were identified by the inspectors for the failure of the licensee to make an eight-hour notification to the NRC for the loss of both emergency diesel generators (EDGs). The licensee entered this into their corrective action program (CAP) as CAP 053463 and updated the event notification (EN 43692) to include the loss of safety function resulting from both EDGs being inoperable from 0408 to 0715 on October 5, 2007.

The inspectors determined that the failure to report the loss of safety function of the onsite emergency AC power system in accordance with 10 CFR 50.72(b)(3)(v) was a performance deficiency. The NRC considers the safety implications of non-compliances that may impact the ability to carry out its statutory mission. Non-compliances may be significant because they may challenge the regulatory envelope upon which certain activities were licensed. This issue is greater than minor, because the failure to report the loss of the EDGs affected the NRC's ability to perform a regulatory function. Because violations of 10 CFR 50.72 are considered to be violations that potentially impede or impact the regulatory process, they are dispositioned using the traditional enforcement process instead of the SDP. However, if possible, the underlying technical issue is evaluated under the SDP to determine the severity of the violation. Using IMC 0609, "Significance Determination Process," the inspectors screened this issue as having very low safety significance using the phase 1 screening questions under the Mitigation System Cornerstone.

Inspection Report# : [2007005](#) (pdf)

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Significance: Oct 19, 2007

Identified By: NRC

Item Type: NCV NonCited Violation

DROP LOAD EVALUATION FOR STUD TENSIONER.

The inspectors identified an NCV of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," that was of very low safety significance for the failure to translate the design bases into procedures and instructions. Specifically, the lift height limit assumed in the drop load analysis for transporting reactor vessel head stud tensioners over the refueling floor was not translated into the lift procedure allowing the licensee to potentially exceed the lift height established in the design basis calculation. This issue was entered into the licensee's corrective action program.

The issue was more than minor, because the failure to provide procedural controls for lifting of the reactor head tensioner could become a more significant safety concern. Specifically, a load drop from a higher elevation could have led to slab failure and potential damage to safe shutdown and safety related equipment on the floors below. This finding was of very low safety significance, because the inspectors answered "no" to all five questions under the Mitigating Systems Cornerstone column of the Phase 1 worksheet. Specifically, even though procedural controls were not in place to ensure that the reactor head tensioner would not be lifted above 6 feet, it could not be determined whether the head had actually ever been lifted above that threshold.

Inspection Report# : [2007007](#) (pdf)

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Significance: Oct 19, 2007

Identified By: NRC

Item Type: NCV NonCited Violation

FAILURE TO ACCOUNT FOR DELAYS IN ECCS MOVs DUE TO VOLTAGE DIPS DURING LOAD SEQUENCING.

The inspectors identified an NCV of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," that was of very low safety significance. Specifically, MOV stroke time delays which result from Emergency Diesel Generator (EDG) voltage drops during load sequencing were not accounted for in assumed Emergency Core Cooling System (ECCS) required Motor Operated Valve (MOV) stroke times. This issue was entered into the licensee's corrective action program.

The issue was more than minor because it was associated with the Mitigating System Cornerstone attribute of "Design Control," and affected the cornerstone objective of ensuring the capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the MOV delays caused by voltage dips during ECCS load sequencing were not accounted for in the licensee's design basis and resulted in a substantive margin reduction (up to 5.3 seconds) in the ECCS injection response time. This finding was of very low safety significance, because the inspectors answered "no" to all five questions under the Mitigating Systems Cornerstone column of the Phase 1

worksheet. Specifically, even though the MOV delays were substantial and resulted in a large margin reduction, a comparison of current In-Service Testing (IST) times versus design basis maximum stroke times revealed that adequate margin still existed to meet the required ECCS response times.

Inspection Report# : [2007007](#) (*pdf*)



Significance: Oct 19, 2007

Identified By: NRC

Item Type: NCV NonCited Violation

FAILURE TO INITIATE A CORRECTIVE ACTION DOCUMENT FOR DEGRADING CABLING.

The inspections identified an NCV of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," that was of very low safety significance. Specifically, the licensee found safety related cable 1S0104-E to be severely degraded due to heat related aging and failed to initiate a corrective action document to evaluate the condition and perform an extent of condition in accordance with plant procedures. This issue was entered into the licensee's corrective action program.

The issue was more than minor because the failure to identify safety related cable failures and perform a proper extent of condition could lead to more significant safety conditions. Specifically, cables failures are adverse conditions that are primarily caused by heat induced aging. If a heat source exists, it is highly probable that other cables are adversely affected. By not writing a corrective action document and performing an extent of condition to replace damaged cables, those cables would instead fail potentially causing plant transients or a loss of mitigating equipment. This finding was of very low safety significance, because the inspectors answered "no" to all five questions under the Mitigating Systems Cornerstone column of the Phase 1 worksheet. Specifically, the cable that was degraded was replaced during the last outage and no additional cables have yet failed in the proximity of the original failed cable. The primary cause of this finding was related to the cross-cutting area of problem identification and resolution because the licensee did not properly identify the cracked and brittle cabling through their corrective action program. (P.I.a.)

Inspection Report# : [2007007](#) (*pdf*)



Significance: Jun 07, 2005

Identified By: NRC

Item Type: VIO Violation

FAILURE TO DEMONSTRATE ADEQUACY OF DESIGN ASSUMPTION FOR TORUS ATTACHED TO PIPING.

A violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Control" having very low safety significance was identified by the inspector. Specifically, the licensee failed to demonstrate that a 1996 high pressure coolant injection (HPCI) modification was subjected to design control measures commensurate with those applied to the original design. The licensee also failed to apply design control measures to verify the adequacy of the design in order to assure that the design basis for torus attached piping was correctly translated into the modification's specifications, drawings, procedures and instructions.

The finding was more than minor because the finding was associated with the cornerstone attribute of design control in the mitigating system cornerstone and the finding was determined to affect the associated cornerstone objective of ensuring the availability of the HPCI system when called upon. Under the worst case scenario, movement of the torus with the additional valve weight on the HPCI turbine exhaust line would result in crimping of the line. Crimping of the line would create additional backpressure in the HPCI turbine and would result in a decrease in the amount of water being injected into the reactor vessel. The finding was determined to be of very low safety significance based upon a Phase 2 analysis of those transients which would involve movement of the torus.

The finding was cited since the licensee did not enter the issue into its corrective action program and did not take actions to correct the noncompliance.

Inspection Report# : [2005010](#) (*pdf*)

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

Barrier Integrity

Emergency Preparedness

Occupational Radiation Safety

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Significance: Dec 31, 2007

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

FAILURE TO ADEQUATELY SURVEY RESULTING IN UNPOSTED, UNCONTROLLED HIGH RADIATION AREA.

A self-revealed finding of very low safety significance and an associated NonCited Violation (NCV) of Title 10 CFR 20.1501 were identified for failure to adequately survey and evaluate the magnitude and extent of radiation levels to ensure that high radiation areas are adequately posted and controlled. On February 7, 2007, a worker entered into an inadequately posted and controlled area in the Reactor Building 734' West Torus Room, which had radiation levels warranting posting and controls for a high radiation area. Corrective actions taken by the licensee included a change in the procedure to survey the Torus Room in the area of shut-down cooling, specifically after low pressure core injection (LPCI) full flow testing that could result in unexpected high radiation areas. A cross-cutting aspect in human performance was associated with this finding in the area of decision-making. (H.1.a)

The issue was more than minor because it was associated with the Program/Process attribute of the Occupational Radiation Safety Cornerstone and affected the cornerstone objective to ensure adequate protection of worker health and safety from exposure to radiation. The issue represents a finding of very low safety significance because it did not involve As-Low-As-Is-Reasonably-Achievable (ALARA) planning or work controls, there was no overexposure, nor did a substantial potential for an overexposure exist given the radiological conditions in the area and the workers response to the electronic dosimeter alarm. Also, the licensee's ability to assess worker dose was not compromised.

Inspection Report# : [2007005](#) (*pdf*)

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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