

Callaway

3Q/2008 Plant Inspection Findings

Initiating Events

Mitigating Systems

Significance: SL-IV Sep 24, 2008

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to Submit a Licensee Event Report for a Condition Prohibited by the Plant's Technical Specifications

The inspectors identified a Severity Level IV noncited violation of 10 CFR 50.73(a)(1) for a failure to submit a required licensee event report within 60 days after discovery of an event requiring a report. On May 21, 2008, Callaway Plant personnel discovered a 6.6 cubic foot void of air within the safety injection system common suction piping. The voided piping, determined to have existed for over a year, was caused by relief valve maintenance on Valve EM8858A that occurred on May 7, 2007. Callaway Plant licensing staff performed a reportability evaluation and determined that the discovery of the void was not required to be reported to the NRC. The inspectors reviewed the licensee's reportability evaluation and associated past operability and determined the event was reportable since a postulated single failure had the potential to disable both emergency core cooling system trains during cold leg recirculation. Since the emergency core cooling system was inoperable from May 7, 2007, until May 21, 2008, the event resulted in an operation or condition which was prohibited by the plant's Technical Specifications as well as an event where a single cause or condition caused two independent trains to become inoperable in a single system.

This finding is greater than minor because the NRC relies on licensees to identify and report conditions or events meeting the criteria specified in the regulations in order to perform its regulatory function. This finding affected the mitigating systems cornerstone. Because this issue affected the NRC's ability to perform its regulatory function, it was evaluated with the traditional enforcement process. Consistent with the guidance in Section IV.A.3 and Supplement I, Paragraph D.4, of the NRC Enforcement Policy, this finding was determined to be a Severity Level IV, noncited violation. This issue was entered into the licensee's corrective action program as Callaway Action Request 200810199. This finding has a crosscutting aspect in the area of problem identification and resolution associated with the corrective action program component because the licensee failed to thoroughly evaluate a void discovered in the emergency core cooling system for operability and reportability.

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

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Significance: Jun 24, 2008

Identified By: NRC

Item Type: NCV NonCited Violation

Inadequate Surveillance Procedure Resulted in an Inoperable Emergency Core Cooling System

The inspectors identified a noncited violation of Technical Specification 3.5.2, "Emergency Core Cooling Systems," after an inadequate surveillance procedure resulted in the licensee failing to maintain the emergency core cooling system full of water as required per Technical Specification 3.5.2. On May 21, 2008, Callaway Plant engineering discovered that a section of the cold leg recirculation piping, specifically the discharge of the residual heat removal pumps to the safety injection pumps, contained 6.6 cubic feet of air. Callaway monthly surveillance Procedure OSP SA 00003, "Emergency Core Cooling Flow Path Verification and Venting," had a purpose to: "Verify the ECCS is full of water," in accordance with Technical Specification Surveillance Requirement 3.5.2.3. The monthly verification and vent procedure was not comprehensive enough to ensure all the emergency core cooling system was full of water.

This finding is more than minor because it was similar to Example 3e of NRC Inspection Manual Chapter 0612, Appendix E, "Examples of Minor Issues," and met the "Not Minor If," criteria because the failure to meet the licensee's administrative requirement for allowable void fraction impacted the ability of the Train A safety injection system to function upon initiation of high-pressure recirculation. This finding affected the mitigating systems cornerstone procedure quality attribute. Using the Manual Chapter 0609.04, "Phase 1 – Initial Screening and Characterization of Findings," the inspectors determined that this finding should be evaluated using the Phase 2 process described in Manual Chapter 0609, Appendix A, "Determining the Significance of Reactor Inspection Findings for At-Power Situations." As described in Section III, of Appendix A, given that the presolved table did not contain a suitable target or surrogate for this finding, the senior reactor analyst used the risk-informed notebook to evaluate the significance of this finding affecting only high-pressure recirculation as very low risk significance (Green). This finding has a crosscutting aspect in the area of human performance associated with the decision making component because the licensee failed to use conservative assumptions in decision making and did not adopt a requirement to demonstrate that a single vent valve was sufficient to vent the affected line rather than assuming that an additional installed valve was not necessary to completely fill, vent, and test the line [H.1(b)].

Inspection Report# : [2008003](#) (*pdf*)

G**Significance:** Jun 24, 2008

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

Failure to Correct a Condition Adverse to Quality for Diesel Generator Jacket Water O-Rings

A self-revealing noncited violation of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," was identified after the licensee failed to promptly correct leakage from diesel generator jacket water o-rings. On February 20, 2008, during a normal surveillance run of Emergency Diesel Generator B, Callaway operations personnel identified an approximately 80 drops per minute jacket water leak caused by premature failure of Nitrile type o-rings. Following restoration of Emergency Diesel Generator B, the licensee re-evaluated the preventative maintenance frequency for jacket water o-ring replacement and reduced the replacement frequency from once every three years to once every refueling cycle. Then, on May 28, 2008, during a routine surveillance run of Emergency Diesel Generator A, Callaway operations personnel identified that Emergency Diesel Generator A had a 200 drops per minute jacket water leak. Similar to the condition observed on Emergency Diesel Generator B on February 20, 2008, the source of the leakage was from Nitrile type o-rings within the jacket water system. The o-rings responsible for jacket water leakage were found to be of similar age to those that failed during the February 20, 2008 surveillance but had not been replaced despite the change to the licensee's preventive maintenance frequency.

This finding, failure to implement adequate corrective actions for degraded Nitrile type o-rings in Emergency Diesel Generator A after previously identifying the adverse condition on Emergency Diesel Generator B, is more than minor because, if left uncorrected, degraded diesel generator jacket water o-rings could become a more significant safety concern. This finding affected the mitigating systems cornerstone. Using Manual Chapter 0609.04, "Phase 1 - Initial Screening and Characterization of Findings," this finding was determined to be of very low safety significance because it was a design deficiency confirmed not to result in loss of operability. This finding has a crosscutting aspect in the area of human performance associated with the work controls component because the licensee failed to plan work activities to support long-term equipment reliability by addressing known degraded conditions in a more reactive than preventative manner [H.3(b)].

Inspection Report# : [2008003](#) (*pdf*)**G****Significance:** Jun 24, 2008

Identified By: NRC

Item Type: VIO Violation

Failure to Prevent Recurrence of Voids in Emergency Core Cooling System Cold Leg Recirculation Piping

The inspectors identified a violation of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," because the licensee failed to restore compliance within a reasonable time by establishing measures to prevent void formation in emergency core cooling system suction piping for the Train A safety injection system. On May 21, 2008, Callaway Plant engineering performed ultrasonic inspection of the safety injection system common suction piping Line EM-023 HCB - 6" and discovered a 6.6 cubic foot voided area. This exceeded the allowable void fraction of 2.1 cubic feet required for operability. This voided piping, determined to have existed for over a year, was caused by relief valve maintenance on Valve EM8858A (May 7, 2007). The maintenance restoration failed to perform a fill and vent to ensure the suction pipe was full of water. The inspectors identified several related examples where the licensee had performed either inadequate operating experience evaluations, inadequate extent of condition reviews, or inadequate procedure corrections.

This finding, failure to restore compliance to prevent recurrence of emergency core cooling system voids was more than minor because it is similar to Example 3e of NRC Inspection Manual Chapter 0612, Appendix E, "Examples of Minor Issues," criteria because the failure impacted the ability of the emergency core cooling system to function upon initiation of high-pressure recirculation. Using the Manual Chapter 0609.04, "Phase 1 - Initial Screening and Characterization of Findings," the inspectors determined that this finding should be evaluated using the Phase 2 process described in Manual Chapter 0609, Appendix A, "Determining the Significance of Reactor Inspection Findings for At-Power Situations." As described in Section III, of Appendix A, given that the presolved table did not contain a suitable target or surrogate for this finding, the senior reactor analyst used the risk-informed notebook to evaluate the significance of this finding as very low risk significance (Green). This finding has a crosscutting aspect in the area of problem identification and resolution associated with the corrective action program component because AmerenUE failed to thoroughly evaluate voiding problems such that the resolutions addressed causes and extent of condition, as necessary [P.1(c)].

Inspection Report# : [2008003](#) (*pdf*)**G****Significance:** Mar 14, 2008

Identified By: NRC

Item Type: NCV NonCited Violation

Nonconservative Technical Specification for Battery Inter-cell Connection Resistances

The team identified a Green noncited violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," because the licensee failed to ensure that Technical Specification Surveillance Requirements for the NK11 and NK14 safety related batteries established limits that met the design requirements. Specifically, until questioned by the team the licensee failed to determine the required design value needed to assure plant safety as requested in Callaway Action Request 200706561. The licensee determined that 69 micro ohms should be the actual allowed inter cell voltage limit to meet the design requirements versus an allowed Technical Specification limit of 150 micro ohms.

The performance deficiency associated with this finding involved the failure to ensure that the NK11 and NK14 safety related batteries would remain operable if all the inter cell connections measured 150 micro ohms as allowed by Technical Specification Surveillance Requirements

3.8.4.2 and 3.8.4.5. This finding was greater than minor because it was associated with the Mitigating Systems cornerstone attribute of maintenance and testing and affects the associated cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Using Manual Chapter 0609.04, "Phase 1 – Initial Screening and Characterization of Findings," the finding was determined to have very low safety significance because it was a design deficiency confirmed not to result in loss of operability. The finding had a cross cutting aspect in the area of problem identification and resolution associated with operating experience because the licensee failed to evaluate in a timely manner relevant internal and external operating experience P.2(a) (Section 40A2.e).

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

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Significance: Dec 31, 2007

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to Establish Needed Test Conditions to Satisfy Technical Specification Surveillance Requirement 3.8.1.18

The inspectors identified a Green noncited violation of 10 CFR 50, Appendix B, Criterion XI, "Test Control," after AmerenUE confirmed that the load shedding emergency load sequencing test could not demonstrate that component cooling water pump breakers would perform satisfactorily in service. On November 19, 2007, AmerenUE determined that quantitative data did not exist to support that component cooling water pump breakers would be capable of closing at Step 1 (5 seconds) of the load shedding emergency load sequence. Technical Specification Surveillance Requirement 3.8.1.18, testing of the emergency load sequencing, required the licensee to verify that load blocks are actuated within +/-10 percent of the specified start time.

This finding, failure to correctly test 4 kV essential bus loading, is more than minor because it was associated with the reactor safety mitigating systems cornerstone attribute of equipment performance and affected the cornerstone objective to ensure availability and reliability of systems that respond to initiating events to prevent undesirable consequences. Using the Manual Chapter 0609, "Significance Determination Process," Phase 1 worksheet, this finding was determined to have very low safety significance because it was not a design or qualification deficiency, did not represent a loss of system safety function, did not represent a loss of safety function of a single train for greater than its Technical Specification allowed outage time and did not affect seismic, flooding, or severe weather initiating events. This finding was evaluated as not having a crosscutting aspect because it was not reflective of current licensee performance.

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

G

Significance: Dec 31, 2007

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to Adequately Manage Increased Risk During a Maintenance Activity

The inspectors identified a Green noncited violation of 10 CFR 50.65(a)(4) after AmerenUE operating personnel failed to implement prescribed risk management actions associated with maintenance on the Train B emergency diesel generator. NRC inspectors performed a walkdown of the risk management actions prescribed and noted the omission of the measures to protect the turbine-driven auxiliary feedwater pump. AmerenUE's review determined that operators failed to follow work instructions to post the protective measure.

This finding is greater than minor because it was related to maintenance risk management, the overall plant risk assessed was greater than 1.0 E-6 and the licensee failed to implement some prescribed significant compensatory measures. Using Manual Chapter 0609, Appendix K, "Maintenance Risk Assessment and Risk Management Significance Determination Process," Flowchart 2, "Assessment of Risk Management Actions," the inspectors determined this finding to be of very low safety significance because other risk management actions were taken. This finding has a crosscutting aspect in the area of human performance associated with the work practices component because operating personnel did not follow instructions to implement the licensee's prescribed risk management actions. [H.4(b)]

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

Barrier Integrity

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Significance: Sep 24, 2008

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to Implement Boric Acid Corrosion Control Procedures

The inspectors identified a noncited violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," for failure to perform a corrosion evaluation of boric acid leakage from containment spray Valve ENHV0006 in accordance with Procedure EDP ZZ 01004, "Boric Acid Corrosion Control Program." On August 29, 2008, the resident inspectors identified an active packing leak on Valve ENHV0006 with impact to carbon steel components on the valve as evident by discolored, brown boron. The leak, which had been active since February 27, 2007, was caused by a stem imperfection that was previously identified on December 5, 2007. The inspectors noted that Valve ENHV0006 did not have a current boric acid corrosion evaluation despite meeting the screening requirements for an evaluation listed in Procedure EDP ZZ 01004, "Boric Acid Corrosion Control Program," Section 4.2. Programmatic boric acid control and work control issues

were a key contributor to not recognizing the need for an updated boric acid corrosion evaluation.

This finding is more than minor because, if left uncorrected, the failure to analyze the effects of boric acid corrosion on safety related components could become a more significant safety concern. This finding affected the barrier integrity cornerstone. Using Manual Chapter 0609.04, "Phase 1 - Initial Screening and Characterization of Findings," this finding was determined to be of very low safety significance because the finding does not represent a degradation of the barrier function of the control room against smoke or toxic atmosphere, does not represent an actual open pathway in the physical integrity of the reactor containment, and does not involve an actual reduction in function of hydrogen igniters in the reactor containment. This issue was entered into the licensee's corrective action program as Callaway Action Request 200809351. This finding has a crosscutting aspect in the area of human performance associated with the work control component because the licensee failed to interdepartmentally coordinate the impact of changes to the work scope for Valve ENHV0006 such that appropriate personnel could perform the necessary evaluations to assure plant performance.

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

G

Significance: Jun 24, 2008

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

Failure to Ensure the Suitability of the Design of the Containment Air Cooler Control Circuitry

A self-revealing noncited violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," was identified after determining that the licensee had not adequately selected and reviewed the suitability of the design of the containment air cooler control circuitry. On March 26, 2008, containment air Cooler A fan shut down when shifted from fast to slow speed. Troubleshooting by the licensee determined that voltage was lost to the control power circuitry when the fast speed thermal overload tripped. Since the overload contacts were wired in series, containment air Cooler A experienced a complete loss of control power rendering it inoperable. The licensee determined the trip to be caused by operation of containment air coolers in fast speed, during a period of higher than normal containment pressure. The licensee analyzed the potential impact of the newly discovered adverse containment cooler design vulnerability against design basis accident scenarios. The licensee determined that a hot zero power main steam line break results in a delayed safety injection signal allowing the fan motor overloads to trip prior to being shed by the load sequencer. The containment air coolers would then experience a complete loss of control power and would not be capable of automatically restarting in slow speed. The analysis revealed that the peak containment pressure limit of 48.1 psig would be preserved. The licensee submitted a Licensee Event Report as required by 10 CFR 50.73 since the inadequate containment air cooler control circuitry resulted in a condition prohibited by the plant's Technical Specifications.

This finding, failure to ensure the design of the containment air cooler control circuitry was suitable for all plant conditions, was more than minor because it was associated with the barrier integrity cornerstone attribute of design control and affects the associated cornerstone objective to provide reasonable assurance that physical design barriers protect the public from radio nuclide releases caused by accidents or releases. Using Manual Chapter 0609 Appendix H, "Containment Integrity Significance Determination Process," this finding was determined to be a Type B finding since it was related to a degraded condition that has potentially important implications for the integrity of the containment, without affecting the likelihood of core damage. This finding was found to be of very low safety significance since containment coolers are structures, systems or components that have no impact on large early release frequency. The inspectors determined that this finding does not have a crosscutting aspect associated with it since the performance deficiency was not indicative of current licensee performance.

Inspection Report# : [2008003](#) (*pdf*)

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Significance: Jun 24, 2008

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to Maintain an Adequate Technical Specification Bases Change Process

The inspectors identified a noncited violation of Technical Specification 5.4.1.a, "Procedures," after Callaway control room operators improperly entered a wrong Technical Specification action statement due to the failure to maintain the Technical Specification Bases current. On June 17, 2008, during surveillance testing, Valve EMHV8823 failed to indicate fully closed. Since EMHV8823 is an isolation valve for containment Penetration 49, the licensee entered Technical Specification 3.6.3, "Containment Isolation Valves," Condition C, with an action to restore the valve to an operable status or isolate the penetration within 72 hours. Approximately 8 hours after valve EMHV8823 had been declared inoperable, Callaway licensing personnel contacted the control room and informed them of an approved Technical Specification Bases change that did not allow Technical Specification 3.6.3 Condition C to be applicable to containment Penetration 49. The Technical Specification Bases change was effective May 1, 2008 but had not been issued to the control room. The licensee determined that the more restrictive Technical Specification 3.6.3, Condition A, should have been entered with an action to isolate the affected penetration within 4 hours. The licensee performed a containment entry following discovery of entry into Technical Specification 3.6.3, Condition A and found that Valve EMHV8823 failed its surveillance due to out of adjustment position indicator limit switches. The valve was verified closed and isolated allowing exit from Technical Specification 3.6.3, Condition A.

This finding, failure to ensure the Technical Specification Bases were maintained current and available to the Callaway control room staff, is more than minor because if left uncorrected, the failure to maintain the Technical Specification Bases current could become a more significant safety concern. This finding was determined to affect the barrier integrity cornerstone. Using Manual Chapter 0609.04, "Phase 1 - Initial Screening and Characterization of Findings," this finding is determined to be of very low safety significance since this finding did not represent an actual open pathway in the physical integrity of reactor containment and did not involve an actual reduction in function of hydrogen igniters in the reactor containment. This finding has a crosscutting aspect in the area of human performance associated with the

decision making component because the licensee failed to communicate, in a timely manner, decisions to personnel who have a need to know the information in order to perform work safely [H.1(c)].

Inspection Report# : [2008003](#) (pdf)

Emergency Preparedness

Occupational Radiation Safety

Significance:  Oct 05, 2007

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

Failure to Adhere to a Radiation Work Permit Requirement

The inspectors reviewed a self-revealing, noncited violation of a Technical Specification 5.4.1.a. required procedure that resulted in the external contamination of a work group with two of the four workers receiving internal contamination. Specifically, a work group alarmed the personnel contamination monitors while exiting the Radiological Control Area. The licensee investigated the event and determined that the workers did not use the faceshields as required by their radiation work permit and that the radiation protection technician failed to recognize that the workers did not have them. As corrective action, the licensee developed a plant systems job aid for new and supplemental radiation protection technicians, added the event as operating experience to radiation protection and radiation worker training, and implemented disciplinary action.

The failure to adhere to a radiation work permit requirement is a performance deficiency. This finding is more than minor because it is associated with the occupational radiation safety exposure control attribute and affected the cornerstone objective to ensure the adequate protection of the worker health and safety from unnecessary exposure to radiation. The failure to adhere to a radiation work permit requirement lead to workers' unintended and additional personnel exposure. The finding was determined to be of very low safety significance because it did not involve: (1) as low as reasonably achievable planning and controls, (2) an overexposure, (3) a substantial potential for overexposure, or (4) an impaired ability to assess dose. In addition, this finding has a human performance crosscutting component with an aspect of work practices in human error prevention techniques because the workers did not use peer- and self-checking to ensure the radiation work permit required protective equipment was used. [H.4(a)]

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

Significance:  Oct 05, 2007

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

Failure to notify radiation protection of an electronic dosimeter alarm.

The inspectors reviewed a self-revealing, noncited violation of a Technical Specification 5.4.1.a. required procedure that resulted when mechanical maintenance workers did not report electronic dosimeter alarms when received. Specifically, during troubleshooting of a waste gas compressor failure, two mechanical maintenance workers received an electronic dosimeter dose rate alarm. The workers exited the room, checked their dosimeters for a dose alarm, determined the noise was due to the compressor and returned to work as no worker had a visible dose alarm. The workers failed to recognize that the electronic dosimeters would not hold and display a dose rate alarm once out of the elevated radiation field. The workers did not notify radiation protection of the electronic dosimeter alarms. When exiting the radiological control area, the electronic dosimeter system alerted the workers to the alarms and barred them from the radiological control area for further entries. As corrective action, the workers were coached on expected dosimeter alarm response and the mechanical maintenance supervisor discussed the event during their group meeting as a learning experience.

The failure to notify radiation protection of an electronic dosimeter alarm is a performance deficiency. This finding is more than minor because it is associated with the occupational radiation safety exposure control attribute and affected the cornerstone objective to ensure the adequate protection of the worker health and safety from unnecessary exposure to radiation. The failure to notify radiation protection in the event of an electronic dosimeter alarm could lead to a worker's unintended and additional personnel exposure. The finding was determined to be of very low safety significance because it did not involve: (1) as low as reasonably achievable planning and controls, (2) an overexposure, (3) a substantial potential for overexposure, or (4) an impaired ability to assess dose. In addition, this finding has a human performance crosscutting component with an aspect of work practices in human error prevention techniques because the workers proceeded in the face of uncertainty or unexpected circumstances when dose rate alarms were received. [H.4(a)]

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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