



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
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ARLINGTON, TEXAS 76011-4125

November 9, 2010

Mr. Adam C. Heflin, Senior Vice
President and Chief Nuclear Officer
AmerenUE
P.O. Box 620
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Subject: CALLAWAY PLANT - NRC INSPECTION PROCEDURE 95001
SUPPLEMENTAL INSPECTION REPORT 05000483/2010007 AND
ASSESSMENT FOLLOWUP LETTER

Dear Mr. Heflin:

On September 29, 2010, the U.S. Nuclear Regulatory Commission (NRC) staff completed a supplemental inspection pursuant to Inspection Procedure 95001, "Inspection for One or Two White Inputs in a Strategic Performance Area," at your Callaway Plant. The enclosed inspection report documents the inspection results, which were discussed at the exit meeting on September 30, 2010, with Mr. Fadi Diya, and other members of your staff.

On March 30, 2010, the train A emergency diesel generator tripped unexpectedly during a planned 24 hour surveillance run due to a lack of lubrication to the governor drive splined sleeve connection to the point that it caused a loss of hydraulic oil pressure in the engine's governor. Combining this run failure with a previous run failure in December 2008, resulting from a leaking gasket in the emergency diesel jacket cooling water system has, in large part, driven the Mitigating Systems Performance Index – Emergency AC Power Performance Indicator White in the first quarter of 2010. As required by the NRC Reactor Oversight Process Action Matrix, this supplemental inspection was performed. The NRC staff was informed on July 14, 2010, of your staff's readiness for this inspection.

The objectives of this supplemental inspection were to provide assurance that: (1) the root causes and the contributing causes for the risk-significant issues were understood; (2) the extent of condition and extent of cause of the issues were identified; and (3) corrective actions were or will be sufficient to address and preclude repetition of the root and contributing causes. The inspection consisted of examination of activities conducted under your license as they related to safety, compliance with the Commission's rules and regulations, and the conditions of your operating license.

The inspectors determined that your evaluation and corrective actions for the White performance indicator were adequate. Your evaluation identified causes involving inadequate instructions, improper gasket fabrication, and the relatively high importance of the emergency diesel generators to overall plant risk. Callaway has taken or plans to take corrective actions in these areas, including adding backup diesel generators to reduce overall plant risk. Your staff also performed an extent of condition and cause review and identified other challenges to

equipment reliability, including the untimely implementation of the Life Cycle Management Plan for the emergency diesel generators.

On November 3, 2010, using the result of this inspection, the NRC staff completed a quarterly review of plant performance of Callaway Plant. The assessment also evaluated the performance indicators and the remaining inspection results for the third quarter of calendar year 2010. We noted that the Mitigating Systems Performance Index – Emergency AC Power Performance Indicator returned to Green at the beginning of the third quarter of 2010. This letter supplements, but does not supersede, our mid-cycle assessment letter issued on September 1, 2010.

Overall, Callaway operated in a manner that preserved the public's health and safety and fully met the cornerstone objectives. All inspection findings for the assessment period were classified as having very low safety significance (Green). As a result, we have assessed Callaway Plant performance to be in the Licensee Response column of the NRC's Action Matrix. Therefore we plan to conduct baseline inspection using during the remainder of the current assessment cycle. This assessment will undergo further review after the resolution of a Frequently Asked Question which you submitted dealing with the counting of unavailability hours for the Mitigating Systems Performance Index Performance Indicator (Proposed FAQ 10-06) and was introduced at the October 20, 2010, Reactor Oversight Process Public Meeting.

The attached report documents one NRC-identified finding having very low safety significance (Green). The finding was determined to involve violations of NRC requirements. The finding had a crosscutting aspect in the area of Problem Identification and Resolution because your staff failed to evaluate operating experience applicable to the root cause in a systematic and timely manner. Because of the very low safety significance and because it is entered into your corrective action program, the NRC staff is treating this finding as a noncited violation (NCV) consistent with Section 2.3.2 of the NRC Enforcement Policy. If you contest the violation or the significance of the noncited violation, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, D.C. 20555-0001, with copies to the Regional Administrator, U.S. Nuclear Regulatory Commission, Region IV, 612 E. Lamar Blvd, Suite 400, Arlington, Texas, 76011-4125; the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555-0001; and the NRC Resident Inspector at the Callaway Plant. In addition, if you disagree with the crosscutting aspect assigned to any finding in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the Regional Administrator, Region IV, and the NRC Resident Inspector at the Callaway Plant. The information you provide will be considered in accordance with Inspection Manual Chapter 0305.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, and its enclosure, will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Please contact me at (817) 276-6574 with any questions you have regarding this letter.

Sincerely,

/RA/

Donald B. Allen, Chief
Project Branch B
Division of Reactor Projects

Docket: 50-483
License: NPF-30

Enclosure:
NRC Inspection Report 05000483/2010007
w/Attachments: Supplemental Information

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U.S. NUCLEAR REGULATORY COMMISSION

REGION IV

Docket: 05000483
License: NPF-30
Report: 05000483/2010007
Licensee: AmerenUE
Facility: Callaway Plant
Location: Junction Highway CC and Highway O
Fulton, MO
Dates: August 30 through September 29, 2010
Inspectors: B. Tindell, Resident Inspector, Lead Inspector
N. Makris, Project Engineer
Approved By: D. Allen, Chief, Project Branch B
Division of Reactor Projects

SUMMARY OF FINDINGS

IR 05000483/2010007; 08/30/2010 – 09/29/2010; Callaway Plant; Supplemental Inspection – Inspection Procedure 95001.

A resident inspector and a project engineer performed this inspection. The inspectors identified one finding having very low (Green) safety significance. The inspectors determined the finding was a noncited violation (NCV). The significance of most findings is indicated by their color (Green, White, Yellow, or Red) using Inspection Manual Chapter 0609, "Significance Determination Process." Findings for which the significance determination process does not apply may be Green or be assigned a severity level after NRC management review. The inspectors determined the finding's crosscutting aspect using Inspection Manual Chapter 0310, "Components Within the Cross-Cutting Areas." The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 4, dated December 2006.

Cornerstone: Mitigating Systems

The NRC staff performed this supplemental inspection in accordance with 95001, "Inspection for One or Two White Inputs in a Strategic Performance Area." The inspectors assessed the licensee's evaluation associated with the Mitigating Systems Performance Index - Emergency AC Power performance indicator, which crossed a threshold from Green to White safety significance in the first quarter of 2010. This issue was documented previously in NRC Assessment Followup Letter dated May 5, 2010. The inspectors determined that the licensee's evaluation and corrective actions for the White performance indicator were adequate. The licensee's evaluation identified causes involving inadequate instructions, improper gasket fabrication, and the relatively high importance of the emergency diesel generators to overall plant risk. The licensee has taken or plans to take corrective actions in those areas, including the installation of additional backup diesel generators. The licensee also performed an extent of condition and extent of cause review and identified other challenges to equipment reliability, including the untimely implementation of the Life Cycle Management Plan for the emergency diesel generators.

The inspectors identified weaknesses in the licensee's root cause evaluation in that the licensee failed to identify a causal factor related to industry recommended maintenance that would have had a high likelihood of preventing the 2010 train A diesel generator failure. As a result, an evaluation of the extent of condition, extent of cause and any potential corrective actions for industry recommended maintenance on the diesel generators and other mitigating equipment was not performed. The licensee revised the evaluation and the planned corrective actions to address this weakness. The inspectors identified additional missed opportunities in the revised evaluation involving other internal and external operating experience related to the causal factor. The licensee initiated a Callaway Action Request to evaluate these additional opportunities.

Given the licensee's acceptable performance in addressing the White performance indicator, this issue will be removed from consideration in assessing plant performance in accordance with Manual Chapter 0305, Operating Reactor Assessment Program." Inspectors will review the licensee's implementation of corrective actions during a future inspection.

Findings

- Green. The inspectors identified a Green noncited violation of 10 Part 50, Appendix B, Criterion V, for the failure to accomplish a root cause evaluation in accordance with station procedures. Specifically, the licensee failed to identify and document that implementing Fairbanks Morse Owners' Group recommended maintenance would have had a high likelihood of preventing the March 30, 2010, emergency diesel generator failure. As a result, the licensee did not classify the addition of maintenance on the governor and the governor drive as a corrective action, and the lack of maintenance was not evaluated for extent of condition and corrective actions, as applicable. This issue has been entered into the licensee's corrective action program as Callaway Action Request 201008405.

The finding was more than minor because it was associated with the mitigating system 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. Specifically, the evaluation failed to discover the lack of maintenance on the diesel governor and drive and the licensee failed to classify the maintenance as necessary. In addition, there was a potential for other recommended maintenance not being performed on mitigating equipment due to not evaluating the extent of condition and cause. Using NRC Manual Chapter 0609, Attachment 4, "Phase 1 - Initial Screening and Characterization of Findings," the finding was determined to be of very low safety significance because the finding did not result in the loss of safety function for mitigating equipment. This finding has a crosscutting aspect in the problem identification and resolution area associated with the operating experience component, in that the licensee failed to evaluate operating experience applicable to the root cause in a systematic and timely manner [P.2(a)] (Section 02.02.f).

REPORT DETAILS

4. OTHER ACTIVITIES

40A4 Supplemental Inspection (95001)

.01 Inspection Scope

The NRC staff performed this supplemental inspection in accordance with Inspection Procedure 95001 to assess the licensee's evaluation of a White Mitigating Systems Performance Index – Emergency AC Power performance indicator, which affected the mitigating systems cornerstone in the reactor safety strategic performance area. The inspection objectives were to:

- Provide assurance that the root and contributing causes of risk-significant issues were understood;
- Provide assurance that the extent of condition and extent of cause of risk-significant issues were identified;
- Provide assurance that the licensee's corrective actions for risk-significant issues were or will be sufficient to address the root and contributing causes and to preclude repetition.

The licensee entered the Regulatory Response Column of the NRC's Action Matrix in the first quarter of 2010 as a result of the performance indicator crossing the threshold from Green (very low safety significance) to White (low to moderate safety significance). The indicator change was associated with two emergency diesel generator run failures. The first run failure occurred on December 24, 2008, when the train B emergency diesel generator developed a jacket water leak that resulted in the licensee declaring the diesel inoperable. The licensee attributed the leak to inadequate compression of a gasket that was installed in 1999, which led to softening and extrusion of the gasket. The gasket was not supplied from the original equipment manufacturer, but was instead fabricated on site from stock material. Following gasket replacement, the diesel was restored to operable status on December 25, 2008. NRC inspectors documented a Green finding for failure to select an adequate replacement jacket water flange gasket during the 1999 maintenance in NRC Inspection Report 05000483/2009007.

The second emergency diesel generator failure occurred on March 30, 2010, when the train A emergency diesel generator unexpectedly lost speed and tripped during a 24-hour surveillance run. The licensee attributed the event to the diesel governor hydraulic actuator coupling failure due to another non-original equipment manufacturer gasket installed in 1999, which blocked oil flow to the governor drive. The licensee requested that the NRC exercise enforcement discretion on April 2, 2010, because the time to repair the diesel exceeded the allowed Technical Specification action time. The NRC granted the licensee Notice of Enforcement Discretion 10-4-001, which allowed the licensee an additional 48 hours to repair the diesel. The diesel was returned to operable status on April 4, 2010. The NRC inspectors documented a finding for not adequately selecting a suitable governor drive gasket in 1999 in Inspection Report 05000483/2010003. The finding was characterized as having very low safety

significance (Green) based on the results of a Phase 3 risk analysis performed by a region-based senior reactor analyst, as discussed in NRC Inspection Report 05000483/2010003. While the two run failures were of Green safety significance individually, the combination of the two caused the Mitigating Systems Performance Index – Emergency AC Power performance indicator to cross the Green-White threshold.

The licensee staff informed the NRC staff on July 14, 2010, of their readiness for a supplemental inspection per Inspection Procedure 95001. In preparation for the inspection, the licensee performed two root cause evaluations, Root Cause Analysis AUCU 10-022, Revision 0, and AUCU 10-033, Revision 0, in order to identify weaknesses that resulted in the White performance indicator.

The inspectors reviewed the licensee's root cause evaluations in addition to other evaluations conducted in support and as a result of the root cause evaluation. The inspectors reviewed corrective actions that were taken or planned to address the identified causes. The inspectors also held discussions with licensee personnel to ensure that the root and contributing causes and the contribution of safety culture components were understood and corrective actions taken or planned were appropriate to address the causes and preclude repetition. As a result of issues identified during the onsite inspection, the licensee revised the original cause evaluations. The inspectors reviewed the revised evaluations in-office, concluding the inspection on September 29, 2010.

.02 Evaluation of the Inspection Requirements

02.01 Problem Identification

- a. Inspection Procedure 95001 requires that the inspectors determine that the licensee's evaluation documented who identified the issue (i.e., licensee-identified, self-revealing, or NRC-identified) and under what conditions the issue was identified.

A self-revealing jacket water leak developed during a monthly surveillance run of train B diesel generator on December 24, 2008, and the licensee declared the diesel inoperable. A self-revealing failure to run of the train A diesel generator occurred during a 24-hour surveillance on March 30, 2010 when the engine unexpectedly lost speed and tripped after approximately 17 hours of operation. The licensee observed the diesel generator trip and declared the diesel inoperable. The inspectors verified that this information was documented in the licensee's evaluations.

- b. Inspection Procedure 95001 requires that the inspection staff determine that the licensee's evaluation of the issue documents how long the issue existed and prior opportunities for identification.

The licensee determined that the train B diesel generator jacket water leak was caused by a fabricated gasket under inadequate compression that had been installed in 1999. The licensee also determined that the leak most likely initiated during the December 24, 2008 run, so there were no prior opportunities to identify a leak. The licensee determined that the incorrect gasket for the train A diesel generator governor drive was in place since 1999, and that there were no prior opportunities to identify the gasket error or damage to the equipment before catastrophic failure.

The inspectors identified that the licensee failed to consider industry recommended preventative maintenance that, had it been performed, could have identified the train A diesel generator governor drive damage before the diesel failed in 2010. This issue is discussed further in Sections 02.02.b and 02.02.c of this report. The licensee revised root cause AUCA 10-022 to address this issue. The inspectors concluded that the licensee's revised evaluation adequately identified how long the issue existed and prior opportunities for identification of the failure.

- c. Inspection Procedure 95001 requires that the inspection staff determine that the licensee's evaluation documents the plant-specific risk consequences, as applicable, and compliance concerns associated with the issues.

The NRC determined that both the 2008 train B diesel generator run failure and the 2010 train A diesel generator run failure were Green findings, as documented in NRC Inspection Report 05000483/2009007 and NRC Inspection Report 05000483/2010003, respectively. As a result of these two run failures, the Mitigating Systems Performance Index – Emergency AC Power performance indicator crossed the Green-White threshold. The inspectors concluded that the licensee adequately documented the risk consequences and compliance concerns associated with the issues.

- d. Findings

No findings were identified.

02.02 Root Cause, Extent of Condition, and Extent of Cause Evaluation

- a. Inspection Procedure 95001 requires that the inspection staff determine that the licensee evaluated the problem using a systematic methodology to identify the root and contributing causes.

For the 2008 train B diesel generator failure, the licensee used an Event and Causal Factor Chart and Why Analysis to identify causal factors and root causes. For the 2010 train A diesel generator failure, the licensee used a Fault Tree Analysis, Event and Causal Factor Chart, and Why Analysis to identify causal factors and root causes. For the White Emergency AC MSPI, the licensee used an Event and Causal Factor Chart, Common Cause Evaluation, and Why Analysis to identify causal factors and root causes.

The inspectors concluded that the licensee evaluated the issues using systematic methodologies to identify root and contributing causes.

- b. Inspection Procedure 95001 requires that the inspection staff determine that the licensee's root cause evaluation was conducted to a level of detail commensurate with the significance of the problem.

The licensee determined the root cause of the 2008 train B diesel generator failure was a lack of instructions for gasket compression; the 2010 train A diesel generator failure root cause was determined to have been a human performance error while fabricating the governor drive gasket; and the White Mitigating Systems Performance Index – Emergency AC Power performance indicator root cause was low margin in the indicator

due to the design of the plant. However, the licensee failed to identify a causal factor for the 2010 train A diesel generator failure in that the owners' group recommendations, had they been fully implemented, would have had a high likelihood of preventing the failure. A finding associated with this issue is described in Section 02.02.f of this report. The inspectors determined that the original evaluation was narrowly focused and not conducted to a sufficient level of detail.

The licensee revised the root cause to address the missed causal factor. The licensee's revised evaluation determined that system engineers had failed to recognize the importance of incorporating industry group recommendations for improving long term diesel generator reliability. The inspectors concluded that the revised root cause evaluation was conducted to a sufficient level of detail.

- c. Inspection Procedure 95001 requires that the inspection staff determine that the licensee's root cause evaluation included a consideration of prior occurrences of the problem and knowledge of prior operating experience.

The licensee's evaluations included an evaluation of internal and external operating experience. As a result of this review, the licensee concluded that there was an adverse trend for site gaskets and for diesel generator age related failures. In addition, the licensee documented that there have been equipment reliability problems due to repetitive issues with slow implementation of maintenance program improvements.

When the licensee revised the 2010 train A diesel generator failure root cause evaluation to address the missed causal factor discussed in Section 02.02.b, the licensee discovered three sources of recommendations for maintenance that potentially could have identified the governor drive degradation prior to failure. Woodward, the governor original equipment manufacturer, the Electrical Power Research Institute, and the Fairbanks Morse Owners' Group recommended replacement of the governor on a periodic basis. In addition, the owners' group recommended inspection of the governor drive every one to two years. The inspectors determined that the governor drive inspection would have had a high likelihood of identifying the degradation and the governor replacement had some additional probability of identifying the degradation before the train A diesel failed in 2010. Therefore, the inspectors concluded that the licensee's original evaluation failed to include sufficient consideration of operating experience.

After the licensee revised the evaluations to address the recommended maintenance activities, the inspectors noted that the licensee had not identified and evaluated additional potential missed opportunities. The inspectors identified one additional prior opportunity to evaluate recommended maintenance on the diesels and two additional prior opportunities to initiate a more robust process to evaluate recommended maintenance. The inspectors identified that Callaway Action Request 200711622, regarding industry diesel generator failures, did not implement the operating experience recommendation to track the diesel generator owners' group recommendations. The inspectors identified that the root cause evaluation for Callaway Action Request 200901896, which attempted to align the site processes and culture to maximize equipment reliability, failed to implement site processes that appropriately evaluate industry recommended maintenance. In addition, the inspectors identified that the diesel Lifecycle Management Program, completed in 2008, had failed to evaluate the licensee's maintenance practices against the owners' group governor maintenance

recommendations, despite evaluating other owners' group recommendations. The licensee initiated Callaway Action Request 201009441 to address these potential missed opportunities.

- d. Inspection Procedure 95001 requires that the inspection staff determine that the licensee's root cause evaluation addressed the extent of condition and the extent of cause of the problem.

The licensee's evaluation considered the extent of condition associated with fabricated gaskets with inadequate compression, gaskets fabricated without necessary ports, and other Mitigating Systems Performance Index systems with low margin. The licensee determined that other gaskets existed with potentially inadequate compression and developed planned corrective actions. The licensee also determined that, for gaskets with required oil ports, all other installed gaskets with were from the original equipment manufacturer and therefore had the necessary ports. The licensee determined that the Mitigating Systems Performance Index – Heat Removal related to auxiliary feedwater, also had low margin. In addition, the licensee performed a review of the diesel generator CARs for extent of cause and determined that age related failures were the most common problem, and that electric equipment was the most commonly affected equipment. The licensee determined that the Lifecycle Management Plan, which was the licensee's designated corrective action for age related failures, was not implemented in a timely fashion.

The inspectors determined that the extent of condition evaluation for industry recommended maintenance failed to identify a causal factor associated with the 2010 train A diesel generator failure, as discussed in Section 02.02.b. As a result, the licensee's extent of condition failed to consider other recommended diesel maintenance as well as other equipment potentially affected by the issue. The licensee revised the evaluations to include plans for the extent of condition review. In addition, the inspectors identified that the licensee failed to consider other potential mechanisms of blocking oil ports in flanges such as misorientation, foreign material or improper use of sealant. In addition, the inspectors identified that the licensee had failed to perform an extent of cause review for other inadequate engineering instructions. As a result, the licensee revised the evaluations to consider other mechanisms for blocking oil ports and added a planned review of engineering instructions. The inspectors concluded that the revised evaluations adequately addressed the extent of condition and extent of cause.

- e. Inspection Procedure 95001 requires that the inspection staff determine that the licensee's root cause, extent of condition, and extent of cause evaluations appropriately considered the safety culture components as described in IMC 0305.

For the 2008 train B diesel generator failure, the licensee identified weaknesses in current performance in the crosscutting area of Human Performance, specifically in the component of Documentation because there was inadequate procedural guidance to ensure that gasket compression was considered when fabricating gaskets. For the 2010 train A diesel generator failure, the licensee identified weaknesses in the crosscutting area of Human Performance, specifically in the components of Work Control and Equipment because there was not adequate instructions for fabrication of the governor drive gasket and because there was an insufficient quantity of original equipment gaskets stocked in the warehouse. For the overall White performance indicator, the licensee found weaknesses in the crosscutting area of Human Performance and

Problem Identification and Resolution, specifically in the components of Risk Significant Decisions, Long-Term Plant Safety, Management Oversight, Corrective Action, Timely Review, and Institutionalization of Operating Experience because the licensee's implementation of recovery plans for reliability and margin for high-risk systems was untimely.

The inspectors determined that the licensee's evaluation of the 2010 train A diesel generator failure did not have an adequate consideration of safety culture components since the licensee failed to identify a causal factor that was indicative of current performance. As a result, the licensee revised the root cause and identified additional weaknesses in the crosscutting areas of Human Performance and Problem Identification and Resolution, specifically in the components of Risk Significant Decisions, Timely Evaluation, and Institutionalization of Operating Experience in that the licensee had failed to identify, correctly evaluate, and implement industry operating experience.

After the licensee revised the evaluation, the inspectors identified other operating experience, internal and external, that the licensee had failed to properly evaluate in the root cause evaluation, as discussed in Section 02.02.d. The inspectors concluded that the failure to identify relevant operating experience in both revisions of the evaluation was a potential indication that the licensee had a weakness in the area of correctly evaluating and implementing industry operating experience related to recommended maintenance.

f. Findings

Introduction. The inspectors identified a Green noncited violation of 10 Part 50, Appendix B, Criterion V, for the failure to accomplish a root cause evaluation in accordance with station procedures. Specifically, the licensee failed to identify and document that implementing Fairbanks Morse Owners' Group recommended maintenance would have had a high likelihood of preventing the March 30, 2010, emergency diesel generator failure. As a result, the licensee did not classify the addition of maintenance on the governor and the governor drive as a corrective action, and the lack of maintenance was not evaluated for extent of condition and corrective actions, as applicable.

Description. The train A emergency diesel generator failed to run on March 30, 2010 during a 24 hour surveillance as a result of a governor drive failure. The licensee performed a root cause evaluation as part of CAR 201002675 to determine the root and contributing causes of the failure and take appropriate corrective actions. The evaluators did not identify any internal or external operating experience that would have prevented the failure, including any industry recommended maintenance. As a result, a corrective action to generate preventative maintenance for the governor and governor drive was improperly classified as an enhancement. During research to implement the enhancement, the licensee staff reviewed the Fairbanks Morse Owners' Group Pielstick Engine Maintenance Recommendations and Good Practices. The document included a recommendation for inspecting the governor drive for wear every one to two years.

The inspectors reviewed the above information and determined that the maintenance recommendations, had they been implemented when issued in 2004, likely would have prevented the train A diesel failure. The licensee documented this issue in Callaway Action Request 201008405 and determined that the lack of maintenance was a causal

factor for the emergency diesel generator failure. As a result of failing to identify the causal factor, the extent of condition and extent of cause, as well as the contributing cause and safety culture aspects of the failure were not evaluated and corrected by the licensee, as appropriate. The inspectors concluded that there was a potential that other industry recommended maintenance would not have been evaluated and implemented on the diesel generators and other mitigating equipment. The inspectors performed a limited review of other diesel failures and determined that no other recent failures were caused by a lack of industry recommended maintenance.

The inspectors determined that the licensee's review of operating experience was untimely and not systematic.

Analysis. The licensee's root cause evaluation failed to identify that implementing Fairbanks Morse Owners' Group recommended maintenance would have had a high likelihood of preventing the March 30, 2010 train A emergency diesel generator failure. The finding was more than minor because it was associated with the mitigating system 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. Specifically, the evaluation failed to discover the lack of maintenance on the diesel governor and drive and the licensee failed to classify the maintenance as necessary. In addition, there was a potential for other recommended maintenance not being performed on mitigating equipment due to not evaluating the extent of condition and cause. Using NRC Manual Chapter 0609, Attachment 4, "Phase 1 - Initial Screening and Characterization of Findings," the finding was determined to be of very low safety significance because the finding did not result in the loss of safety function for mitigating equipment. This finding has a crosscutting aspect in the problem identification and resolution area associated with the operating experience component, in that the licensee failed to evaluate operating experience applicable to the root cause in a systematic and timely manner [P.2a].

Enforcement. Title 10 CFR Part 50, Appendix B, Criterion V, requires, in part, that activities affecting quality shall be prescribed by documented procedures and shall be accomplished in accordance with these procedures. Callaway Procedure APA-ZZ-00500, Appendix 12, "Significant Adverse Condition – Significance Level 1," revision 7, step 4.3.8, stated "Identify and Document Causal Factors of the problem." Contrary to the above, prior to August 30, 2010, the licensee failed to accomplish an activity affecting quality in accordance with documented procedures. Specifically, the licensee failed to accomplish root cause evaluation AUCA 10-022 in accordance with Procedure APA-ZZ-00500, in that they failed to identify and document the causal factor of failure to follow Fairbanks Morse Owners' Group recommended maintenance, which would have had a high likelihood of preventing the March 30, 2010, train A emergency diesel generator failure. Since the violation was of very low safety significance and was documented in the licensee's corrective action program as condition report CAR 2010008405, it is being treated as a noncited violation, consistent with Section 2.3.2 of the NRC Enforcement Policy: NRC 05000483/2010007-01, "Failure to Identify Lack of Maintenance as Cause of Diesel Generator Failure."

02.03 Corrective Actions

- a. Inspection Procedure 95001 requires that the inspection staff determine that appropriate corrective actions are specified for each root and contributing cause or that the licensee has an adequate evaluation for why no corrective actions are necessary.

The licensee took immediate corrective actions to restore the train B diesel generator in 2008 by replacing the failed gasket. In addition, the licensee contacted a gasket expert to ensure that the replacement gasket was under the required compression. The corrective action to prevent recurrence added instructions to specifically address gasket compression in evaluations. The licensee took immediate corrective actions to restore the train A diesel generator failure in 2010 by replacing the inadequate gasket and failed parts in the governor and governor drive. The corrective action to prevent recurrence added instructions to ensure that the governor drive gasket had the correct oil port and orientation when installed. In addition, for the contributing cause of insufficient original equipment gaskets in stock, the licensee designated minimum quantities to have onsite. For the White performance indicator, the licensee's corrective action to prevent recurrence was to increase the indicator's margin by installing back-up diesel generators, which both increased the performance indicator margin and reduced baseline Core Damage Frequency by approximately half. In addition, for the contributing cause of not implementing corrective actions to increase margin in the past, the licensee established internal performance indicators for remaining margin in MSPI and established an internal owner of the MSPI process.

For the 2008 train B diesel generator failure, the inspectors determined that the instructions developed as a corrective action to prevent recurrence were not sufficient to successfully perform an evaluation and the training provided to the evaluators was minimal. As a result, the licensee revised the instructions and initiated a training request for the evaluators. The inspectors determined that the revised corrective actions were appropriate to prevent recurrence. For the 2010 train A diesel generator failure, the inspectors determined that the licensee's failure to identify the causal factor related to industry maintenance recommendations, as discussed in Section 02.02.b of this report, led the licensee to classify the addition of governor and governor drive maintenance as an enhancement instead of a corrective action. In addition, the licensee potentially failed to implement other applicable industry recommended maintenance or to implement a formal method of evaluating future industry recommendations. The inspectors concluded that the original planned corrective actions for the 2010 train A diesel generator failure were inadequate in that current and future industry recommended maintenance might not be appropriately implemented. The licensee revised the cause evaluation and developed new corrective actions to address incorporation of preventive maintenance recommendations. The inspectors concluded that the revised proposed corrective actions were appropriate and addressed each root and contributing cause.

- b. Inspection Procedure 95001 requires that the inspection staff determine that the licensee prioritized corrective actions with consideration of risk significance and regulatory compliance.

The licensee's immediate corrective actions for both diesel generator failures focused on restoring operability of the equipment. The licensee's corrective actions to address the root and contributing causes were prioritized in accordance with Procedure APA-ZZ-00500, "Corrective Action Program," Revision 51. The inspectors concluded that the

corrective actions were prioritized with consideration of risk significance and regulatory compliance.

- c. Inspection Procedure 95001 requires that the inspection staff determine that the licensee established a schedule for implementing and completing the corrective actions.

The licensee established due dates for the corrective actions in accordance with Procedure APA-ZZ-00500, "Corrective Action Program," Revision 51. The due dates were documented in evaluations AUCA 10-022 and AUCA 10-033. The inspectors concluded that an appropriate schedule had been established for implementing and completing the corrective actions.

- d. Inspection Procedure 95001 requires that the inspection staff determine that the licensee developed quantitative or qualitative measures of success for determining the effectiveness of the corrective actions to preclude repetition.

The licensee will determine the effectiveness of corrective actions for the 2008 train B diesel generator failure by verifying there are no component failures within Mitigating System Performance Index system boundaries due to incorrectly installed gaskets within 36 months of the evaluation. The licensee will determine the effectiveness of corrective actions for the 2010 train A diesel generator failure by inspecting the governor drive casing to ensure proper lubrication of the drive train following at least one year of operation. The inspectors concluded that quantitative measures of success had been developed for determining the effectiveness of the corrective actions to preclude repetition.

- e. Inspection Procedure 95001 requires that the inspection staff determine that the licensee's planned or taken corrective actions adequately address a Notice of Violation that was the basis for the supplemental inspection, if applicable.

The NRC did not issue a Notice of Violation to the licensee. Therefore, this inspection requirement was not applicable.

- f. Findings

No findings were identified.

40A6 Meetings

Exit Meeting Summary

On September 30, 2010, the inspectors presented the inspection results to Mr. F. Diya, and other members of the licensee staff. The licensee acknowledged the findings and weaknesses presented. The inspectors asked the licensee whether any materials examined during the inspection should be considered proprietary. The proprietary information identified was returned to the licensee and is not included in this report.

ATTACHMENT: Supplemental Information

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel

F. Diya, Vice President, Nuclear
S. Sandbothe, Manager, Plant Support
L. Kanuckel, Manager, Plant Engineering
S. Maglio, Assistant Manager, Regulatory Affairs
L. Eitel, Supervising Engineer, Plant Engineering
R. Wink, Supervising Engineer, Regulatory Affairs/Licensing
S. Petzel, Engineer, Regulatory Affairs
R. Wissel, System Engineer

LIST OF ITEMS OPENED AND CLOSED

Opened and Closed

05000483/2010007-01 NCV Failure to Identify Lack of Maintenance as Cause of Diesel Generator Failure (Section 02.02f)

LIST OF DOCUMENTS REVIEWED

CALLAWAY ACTION REQUESTS

200505859	200711622	200812985	200901896	200908841	200909091
201002675	201002916	201003236	201008156	201008184	201008334
201008347	201008405				

PROCEDURES

APA-ZZ-00500	Corrective Action Program	Revision 51
EDP-KJ-03001	Emergency Diesel Generator Reliability Program	Revision 6

MISCELLAENOUS

Final Report Number AUE-12-21432, Life Cycle Management Plan for the Emergency Diesels, January 2008

Sheet Gasket Manual, Revision 5

Fairbanks Morse Owners' Group Pielstick Engine Maintenance Guidelines Governor Maintenance Recommendations and Good Practices, Revision 0

NOED 10-4-001, NRC Notice of Enforcement Discretion for Union Electric Company Regarding Callaway Plant, Unit 1