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10 CFR 2.201

May 13, 1994

Docket No. 50-352

License No. NPF-39

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555

SUBJECT: Limerick Generating Station, Unit 1
Reply to Notice of Violation
NRC Notice of Violation and Inspection Report Nos. 50-352/94-03 and 50-353/94-03

REFERENCE: 1) Letter from James M. Trapp, USNRC, to D. M. Smith, PECO Energy, dated April 14, 1994
2) Letter from Richard J. Clark, USNRC, to G. J. Beck, PECO Energy, dated June 3, 1991

Dear Sirs:

The transmittal letter for Inspection Reports 50-352/93-30 and 50-353/93-30 and the accompanying Notice of Violation indicate that this inspection was a "reactive safety inspection" in response to a single failure to start of one of Limerick Generating Station's (LGS) eight Emergency Diesel Generators (EDG) during an October 26, 1993 test. During the inspection the NRC reviewed vendor recommendations, modifications, maintenance practices, and equipment condition. The transmittal letter states that the root cause for the failure was identified and the corrective actions taken were appropriate. During this inspection two cited level IV violations were identified for 1) failure to properly inspect the air start distributor timing and 2) failure to implement vendor recommendations regarding tang to air start distributor deformation.

PECO Energy believes that this reactive inspection and the indicated violations are unwarranted and inconsistent with the Station Blackout and Maintenance Rules. Additionally, these actions are contrary to the entire philosophy of performance based regulation contained in both rules. As such, the violations are contested.

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The Station Blackout Rule, 10CFR50.63, and its implementing guidance requires that licensees monitor EDG performance and maintain their reliability above a target value. Reg Guide 1.155 establishes that NUMARC 87-00, Appendix D provides the basis for an acceptable EDG reliability program. The NRC's SER, ref. 2, assesses LGS compliance with the Station Blackout Rule and acknowledges the suitability of the established target reliability (0.95). Additionally, the Maintenance Rule, 10CFR50.65, and its implementing guidance acknowledge the suitability of such programs for the management of EDG reliability.

Including the October 26, 1993 test failure, the reliability of the LGS EDG's is currently 0.99 for the last 100 demands which is well above the established target value. Additionally, it should be noted that the reliability of the LGS EDG's has always been well above the target value.

Given the demonstrated level of LGS EDG reliability, the isolated nature of the test failure, the existence of an EDG reliability program consistent with established standards, and the proven effectiveness of the station root cause analysis and corrective action program, we have concluded that a reactive inspection was not warranted and that the cited violations are inappropriate. As such, we request that the proposed violations be withdrawn.

Although we contest the proposed violations, corrective actions have been taken for the noted conditions as described in the attachment to this letter.

Very truly yours,



Attachment

cc: T. T. Martin Administrator, Region 1, USNRC
W. T. Russell, Director, Office of Nuclear Reactor Regulation, USNRC
N. S. Perry, USNRC Senior Resident Inspector, LGS

Restatement of the Contested Violations

During an NRC inspection conducted on November 12, 1993, through February 1, 1994, two violations of NRC requirements were identified. In accordance with the "General Statement of Policy and Procedure for NRC Enforcement Actions," 10 CFR Part 2, Appendix C, the violations are listed below:

- A. Technical Specification 6.8.1.a requires that written procedures be established, implemented, and maintained, covering activities recommended in Appendix A of Regulatory Guide 1.33, Revision 2, February 1978.

Regulatory Guide 1.33, Appendix A, recommends the establishment of procedures for performing maintenance on safety-related equipment.

Maintenance Procedure PMQ-020-010, DIESEL ENGINE EXAMINATION AND GENERAL MAINTENANCE, Revision 14, dated June 30, 1993, specifies in part in steps 7.27.7 and 7.27.8 to bar engine No. 8 cylinder inner dead center (48 degrees on the coupling pointer) and aligning matchmarks between the camshaft and the distributor shaft. Ensure distributor cam is installed with the AR3 timing mark aligned to the No. 8 cylinder port.

Contrary to the above, during the D14 June/July 1993 overhaul, the air start distributor cam was not installed in accordance with the maintenance procedure with the AR3 timing mark aligned up to the number 8 cylinder port. This was not discovered until the D14 failed to start during a routine surveillance test on October 26, 1993.

This is a Severity Level IV violation (Supplement I)

- B. Technical Specification (TS) Section 4.8.1.1.2.e.1, requires that at least once each refueling cycle, subjecting the diesel to an inspection in accordance with procedures prepared in conjunction with its manufacturer's recommendations for this class of standby service.

Contrary to the above, as of November 12, 1993, a procedure to perform upper air start distributor shaft alignment inspection as recommended in the EDG vendor letter dated April 25, 1991, had not been written. During the last refueling outage, the D14 air start distributor shaft alignment inspection was not performed in accordance with the emergency diesel generator vendor's recommendations.

This is a Severity Level IV violation (Supplement I).

RESPONSE

Violation A.

Basis for Disputing the Violation

As stated in the transmittal letter, PECO Energy believes that this reactive inspection and the indicated violation are unwarranted and inconsistent with the Station Blackout and Maintenance Rules. Additionally, these actions are contrary to the entire philosophy of performance based regulation contained in both rules. As such, the violation is contested.

The Station Blackout Rule, 10CFR50.63, and its implementing guidance requires that licensees monitor EDG performance and maintain their reliability above a target value. Reg Guide 1.155 establishes that NUMARC 87-00, Appendix D provides the basis for an acceptable EDG reliability program. The NRC's SER, ref. 2, assesses LGS compliance with the Station Blackout Rule and acknowledges the suitability of the established target reliability (0.95). Additionally, the Maintenance Rule, 10CFR50.65, and its implementing guidance acknowledge the suitability of such programs for the management of EDG reliability.

Including the October 26, 1993 test failure, the reliability of the LGS EDG's is currently 0.99 for the last 100 demands which is well above the established target value. Additionally, it should be noted that the reliability of the LGS EDG's has always been well above the target value.

Given the demonstrated level of LGS EDG reliability, the isolated nature of the test failure, the existence of an EDG reliability program consistent with established standards, and the proven effectiveness of the station root cause analysis and corrective action program, we have concluded that a reactive inspection was not warranted and that the cited violation is inappropriate. As such, we request that the proposed violation be withdrawn.

Reason for the Cited Condition

This event is discussed completely in LER 1-93-013, Rev. 1 dated February 14, 1994. The identified condition was caused by personnel error due to less than adequate self-check/verification as summarized below.

Preventative Maintenance (PM) Procedure PMQ-020-010, "Diesel Engine Examination and General Maintenance," Revision No. 14, dated June 30, 1993, step 7.27.8 requires two actions to be taken. The first action is to install the EDG air start distributor shaft making sure to align the match marks on both the air start distributor shaft and the EDG overspeed governor shaft. The second action is to ensure that the AR3 timing mark on the distributor cam is aligned to the No. 8 cylinder port (the cam is attached to the air start distributor shaft).

During the July, 1993 EDG inspection, the air start distributor shaft was match marked with the overspeed governor shaft and was removed with the cam still attached. Because of the physical arrangement of the connection between the air start distributor shaft and the overspeed governor shaft, the air start distributor shaft can only be installed either in the proper alignment (i.e., with the match marks aligned) or 180 degrees out of alignment. During reinstallation, care was taken to insure that the distributor shaft lined up with the match marks on the overspeed governor shaft. Prior to the June 30, 1993 revision of procedure PMQ-020-010, this was the only action required by procedure step 7.27.8 to verify proper cam alignment.

Revision 14 of procedure PMQ-020-010, which was implemented just prior to this inspection, added the action to step 7.27.8 to ensure that the distributor cam is installed with the AR3 timing mark aligned to the No. 8 cylinder. However, the mechanics failed to adequately check this alignment because the cam had not been physically removed from the air start distributor shaft, and therefore, the physical relationship of the cam to the distributor shaft had not been disturbed. Therefore, the mechanics assumed that the cam would be in the proper alignment once the distributor shaft was properly installed. Had the mechanics adequately performed the revised procedure step 7.27.8, this misalignment condition would have been identified.

A contributing factor to this violation was that the signoff on the Maintenance Data Record Form (MDRF) associated with procedure PMQ-020-010 did not accurately reflect the actions specified by the recently revised procedure step 7.27.8. The signoff on the MDRF for step 7.27.8 as worded only addressed verifying that the distributor shaft had been installed with the match marks properly aligned, but did not address verifying proper cam alignment.

Corrective Actions

The following corrective actions identified in the LER were undertaken:

The cam on the air start distributor was realigned, a timing check was successfully performed, and the D14 EDG was returned to service on November 15, 1993.

Procedure PMQ-020-010 will be revised prior to the next EDG inspection currently scheduled for August 1994 to provide clarification of the actions necessary to ensure proper timing of the air start distributor. This revision will include the appropriate changes to the MDRF to ensure that the signoffs accurately reflect the respective procedure steps.

In addition, the following corrective actions were or will be taken.

The mechanics and technical personnel involved in this event were counselled on the need for greater attention to detail, particularly concerning recent procedure revisions, and the proper use of self-check/verification during the performance of work related activities.

A training bulletin will be issued by June 15, 1994, to the maintenance supervisory staff discussing this violation and its causes as they relate to the need for discussion of recent procedure revisions during the pre-job briefing.

Violation B.

Basis For Disputing The Violation

As stated in the transmittal letter, PECO Energy believes that this reactive inspection and the indicated violation are unwarranted and inconsistent with the Station Blackout and Maintenance Rules. Additionally, these actions are contrary to the entire philosophy of performance based regulation contained in both rules. As such, the violation is contested.

The Station Blackout Rule, 10CFR50.63, and its implementing guidance requires that licensees monitor EDG performance and maintain their reliability above a target value. Reg Guide 1.155 establishes that NUMARC 87-00, Appendix D provides the basis for an acceptable EDG reliability program. The NRC's SER, ref. 2, assesses LGS compliance with the Station Blackout Rule and acknowledges the suitability of the established target reliability (0.95). Additionally, the Maintenance Rule, 10CFR50.65, and its implementing guidance acknowledge the suitability of such programs for the management of EDG reliability.

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Given the demonstrated level of LGS EDG reliability, the isolated nature of the test failure, the existence of an EDG reliability program consistent with established standards, and the proven effectiveness of the station root cause analysis and corrective action program, we have concluded that a reactive inspection was not warranted and that the cited violation is inappropriate. As such, we request that the proposed violation be withdrawn.

Reason For the Cited Condition

This condition was caused by the failure of PECO Energy Company personnel to formally document the disposition of an EDG vendor recommendation.

In July of 1989, PECO Energy maintenance personnel discovered that the tang on the EDG overspeed governor shaft which turns the auxiliary air start distributor had twisted and the diagonal corners of the tang were rounded. In addition, the mating slot on the air start distributor shaft exhibited the imprint of the tang corners. This condition was found to exist on all LGS EDGs. The EDG with the worst deformation (D13) was disassembled and the parts were sent to the vendor (i.e., Coltec Industries - Fairbanks Morse Engine Division) for analysis to determine the cause of the deformation, even though no EDG failures had been experienced and no degraded performance of the air distributor had been observed at LGS as a result of the deformation. As a result of the PECO Energy initiative, Coltec performed a detailed investigation that resulted an April 25, 1991 letter to PECO which transmitted an internal engineering report and an internal 10CFR21 evaluation. The letter indicated that a safety hazard did not exist. Additionally, the 10CFR21 evaluation concluded that a substantial safety hazard did not exist, and confirmed that no EDG failures to start had been seen, even with the deformed shafts. Based on this information, PECO Energy personnel concluded that the tang/slot deformation was not a significant problem.

With respect to the specific recommendation that the air start distributor shaft be inspected to verify proper alignment, the internal engineering report indicated that the factors affecting the uncertainty in the alignment of the air start distributor shaft are the bolt hole clearances and dimensioning tolerances of the associated EDG end cover and distributor housing. These clearances and tolerances were considered by PECO Energy personnel to be minimal, and not a significant impact on shaft alignment. Therefore, LGS responded to the vendor letter by continuing to perform a visual inspection of the amount of tang deformation on each of the EDGs. This inspection has been conducted each time an EDG was disassembled for the purpose of determining if the deformation was sufficient to require replacing/modifying the tang/slot assembly with replacement parts as suggested in the vendor's internal engineering report. This replacement/modification would enhance the tang engagement in the slot, and was considered to be a solution by LGS personnel that would be implemented once the deformation reached a point where proper tang/slot engagement could not be achieved. Visual inspections have not revealed excess deformation, thus not requiring the assembly to be replaced/modified. Until such time as replacement was required, LGS planned to continue to evaluate the tangs on a case-by-case basis during each 18 month inspection. The original inspection of the tangs was conducted in the presence of a vendor representative; however, this disposition of the vendor recommendations, the results of the informal inspections, and the vendor's approval of this disposition were not documented.

A contributing factor to this violation was the manner in which the information was received from the vendor. The letter, which stated that it provided service information, was not submitted to PECO Energy through the Correspondence Control Desk per the established process for entry of the vendor service information into for eventual routing to the Operating Experience Assessment Program. Instead, the letter was sent directly to the site EDG system engineer with a copy to the corporate engineer in the Nuclear Engineering Division responsible for the EDGs (as would typically be the case concerning an engineering analysis report). Likewise, the letter was not printed on the typical letterhead/form which states "Service Information Letter" in bold letters. Therefore, the recommendations were not treated as those which are normally provided through the Service Information Letter process. They were treated by the engineers involved simply as a response to PECO Energy's 1989 request for analysis.

Corrective Actions

An evaluation of the deformed tang and slot by PECO Energy's Metallurgical Laboratory revealed that the stresses on the tang/slot contact point are relieved due to the increased contact surface area resulting from the deformation, i.e., the forces involved are equalized, the proper clearances are re-established, and the deformation stops. Subsequent deformation does not occur unless the tang/slot connection is disturbed and new contact mating surfaces are formed. The vendor concurred that every time the tang/slot connection is re-established, for example, following reassembly from a teardown inspection, and the EDG engine is run for a short period of time (i.e., minutes), the tang may deform slightly, but this is acceptable as long as the engine can be properly timed. Considering this fact, the vendor has indicated that an acceptable alternative to their original recommendation, i.e., for an interim period of time, is to run the engine for a short period of time after the tang/slot connection is re-established and then perform a timing check of the engine to ensure proper cam alignment. A timing check was successfully performed on each EDG in November, 1993 following the D14 EDG failure to start event to ensure that all EDGs were operable.

Attachment
Docket 50-352
May 12, 1994
Page 6 of 6

The tang/slot assembly will be replaced/modified as discussed in the vendor's April 25, 1991 letter to increase the tang/slot engagement surface area and to refine the alignment of the shafts to reduce the potential for deformation of the tang/slot. This upgrade is expected to be implemented on each EDG during its next scheduled five (5) year overhaul.

A modification will be implemented during the next routine inspection for each EDG to connect the lower air start distributor piping to the aft bearing oil booster. This enhancement was recommended by Coltec in a letter issued on May 23, 1986; however, LGS was not included in the distribution for this letter. Until these modifications are completed, the affected EDG will be considered inoperable, but available, if its upper air start distributor system is out of service.

A comprehensive review will be performed by June 1, 1994, in order to determine if any other relevant service information was not received from Coltec.

A visual inspection of proper alignment of the air start distributor shaft will be proceduralized prior to the next EDG inspection currently scheduled for August 1994.

A comprehensive review of the EDG inspection and maintenance procedures will be performed by Engineering, Maintenance, and Coltec prior to the next EDG inspection currently scheduled for August, 1994 to determine if there are any other discrepancies with respect to Coltec inspection recommendations.

A letter to the vendor will be transmitted by June 30, 1994, reiterating the proper addressee information for proper routing of correspondence.