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JOHN S. KEMPER
SENIOR VICE-PRESIDENT - NUCLEAR

February 5, 1988

Docket No. 50-352

Mr. William T. Russell
Regional Administrator
U. S. Nuclear Regulatory Commission,
Region I
Attn: Document Control Desk
Washington, DC 20555

SUBJECT: Limerick Generating Station, Unit 1
Reply to Notice of Violation
(Inspection Report Nos. 50-353/87-11 and
50-352/87-27)

Dear Mr. Russell:

Your letter dated December 30, 1987 transmitted the "Notice of Violation" concerning the Inspection Reports 50-353/87-11 and 50-352/87-27. These Inspection Reports were previously transmitted to the Philadelphia Electric Company in letters dated September 28, 1987 and November 23, 1987, respectively.

The "Notice of Violation" described the failure to provide adequate fire protection features for control cables associated with the Emergency Diesel Generators (EDGs) to assure that one redundant train remained free of fire damage. Attached is our reply to the Notice of Violation.

A one week extension to allow for submittal of this response within thirty days from receipt of the notice was discussed in a telephone conversation between Mr. W. C. Birely of Philadelphia Electric Company and Mr. J. Linville of Region I on February 1, 1988.

If you have any questions or require additional information, please do not hesitate to contact us.

Very truly yours,

John S. Kemper

Attachment

HTJ/kem/01258804

cc: Addressee
E. M. Kelly, Senior Resident Inspector

IE01
1/1

Philadelphia Electric Company's
Reply to the Notice of Violation

Restatement of the Violation

License Condition 2.c.3, requires, in part, that the licensee maintain in effect all provisions of the Fire Protection Evaluation Report (FPER) through Revision 6.

Section 3.2.1 of the FPER through Revision 6 specifies that fire protection features shall be provided for structures, systems and components important to safe shutdown, and shall be capable of limiting fire damage so that one train of systems necessary to achieve and maintain hot shutdown conditions from either the control room or emergency control station(s) is free of fire damage.

Contrary to the above, as of October 2, 1987, fire protection features were not provided for control cables associated with the Emergency Diesel Generators (EDGs), a system important in maintaining safe shutdown, to assure that one redundant train remained free of fire damage. These control cables were associated with the automatic fire suppression system flow switches that shut down the EDGs in the event of a fire in the EDG room. These cables were routed in the service water pipe tunnel area and were not provided with a means to maintain one of the trains free of fire damage. If a fire occurred in the tunnel area, it could create multiple internal shorts in the connections between the flow switches and associated time delay relays resulting in trip signals for all four EDGs, with two EDGs required by the FPER to achieve and maintain hot shutdown.

Admission or Denial of the Violation

Philadelphia Electric Company acknowledges the violation as stated.

Reason for the Violation

The reason for the violation was a deficiency in a procedure used during the comprehensive Appendix R Safe Shutdown Fire Analysis conducted for LGS Unit 1 in 1982. During the identification of safe shutdown cables and the associated circuit analysis, all cables whose failure could cause the disabling of safe shutdown equipment were to be identified. One criterion in the procedure for exclusion of these associated circuits from the safe shutdown cable data base (Drawing 8031-E-1550) was that if they were isolated from the safe shutdown cables via a Class 1E isolation device, then their failure could not propogate back into the safe shutdown circuitry and no further analysis was required. This exclusion criterion was deficient in that it did not address the need to evaluate the functional association between non-class 1E circuits and class 1E circuits. In this event, the

functional association was between the non-class 1E fire protection flow switches and the EDG trip circuitry. Although these cables met the required electrical isolation criterion, they should have been identified as safe shutdown cables because of the functional trip of diesel generator by the fire protection system. Because these cables were not properly identified and analyzed as safe shutdown cables, the effect of a fire on these cables was not considered.

Extent or Significance of the Violation

These cables supply power to EDG fire suppression flow switches which function to trip a EDG from service when fire suppression water flow to the EDG cell is sensed under non-LOCA condition. This action was designed to minimize the potential damage which could result from the sprinkler system spraying water on an operating diesel. The subject cables are all located in Fire Area 75, the Service Water Pipe Tunnel. An Appendix R design basis fire in that area, postulated to cause the shorting of the internal conductors of these cables, could cause a trip signal to all four EDG's under non-LOCA conditions.

Corrective Actions and Results Achieved

The supply breaker (Panel 10Y202-Circuit 17) for the flow switch power cables was promptly de-energized under a Temporary Circuit Alteration (TCA). The four flow switch relays (74-51528-13, 74-51628-13, 74-51728-13, 74-51828-13) were removed on October 21, 1987 under Modification 87-5457. An evaluation of the consequences of de-energizing the power cables and removing the flow switch circuit relays has determined that these actions will not adversely affect the ability of the EDGs to perform their safety function, nor will any of the other protective features associated with the EDGs be adversely affected.

Defeating the fire protection flow switch logic circuitry will prevent an automatic EDG trip from occurring should the fire suppression system actuate or an Appendix R fire occur.

Actions to Prevent Recurrence

The Fire Protection - EDG trip is believed to be the only case at LGS where non-Class 1E circuitry generates a functional trip in Class 1E circuitry. However, as committed to at the October 22, 1987 Enforcement Conference, the 1982 Appendix R review for LGS is being evaluated to provide assurance that this violation is an isolated case. As part of this review, relay arrangements between and among Class 1E/non-1E circuits are being reviewed and documented. There are four arrangements possible between Class 1E or non-1E relay coils and their Class 1E and/or non-1E contacts. The relay arrangement review includes relays in both safety and non-safety systems and documents which of the four arrangements exists for each relay. In addition, the Bechtel drawing revision approval process has been expanded to include

verification that undesirable coil and contact arrangements are not created by modification work.

Also, to help us to avoid situations such as occurred in this case, we have reviewed the sections of our Quality Assurance Plans that address the evaluation of potentially reportable defects and noncompliances and have initiated changes. These changes will be incorporated within 60 days.

Date for Full Compliance

The relay arrangement review will be completed by March 31, 1988.

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