

February 24, 1994

Docket No. 50-412
License No. NPF-73
EA 93-296

Mr. J. D. Sieber
Vice President, Nuclear Group
Duquesne Light Company
Post Office Box 4
Shippingport, Pennsylvania 15077

Dear Mr. Sieber:

SUBJECT: NOTICE OF VIOLATION AND PROPOSED IMPOSITION OF CIVIL
PENALTY - \$50,000
(NRC Inspection Report No. 50-412/93-81)

This letter refers to the NRC Augmented Inspection Team (AIT) inspection conducted between November 9 and 19, 1993, at Unit 2 of the Beaver Valley Power Station in Shippingport, Pennsylvania. The inspection report was sent to you on December 21, 1993. The inspection included a review of the failure of both trains of the emergency diesel generator (EDG) load sequencers to load safety related equipment on the emergency buses during surveillance testing. As a result of this inspection, a violation of NRC requirements was identified. On January 18, 1994, an enforcement conference was held with you and members of your staff to discuss these occurrences, the apparent violation, its causes and your corrective actions.

On November 4 and 6, 1993, during the performance of regularly scheduled surveillance tests, the train A and train B EDG load sequencers failed to automatically load safety related equipment onto the emergency buses. The failure of both EDG load sequencers would prevent automatic initiation of the emergency core cooling systems in the event of a loss of coolant accident (LOCA) with a loss of offsite power.

Your investigation indicated the cause of the load sequencer failures was misoperation of the safety injection reset microprocessor timer/relays, due to negative voltage spikes introduced by auxiliary relays. Certain electro-mechanical relays in the EDG load sequencers were replaced with microprocessor based relays in 1990. However, the potential damaging effect on the microprocessor based relays of voltage spikes generated when auxiliary relays deenergize was not considered. This resulted in a common mode failure of both EDGs

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during the surveillance testing on November 4 and 6, 1993. The susceptibility of microprocessor based equipment to voltage disturbances and electromagnetic interference was well known at the time of this design change. Adequate detail was not provided in the design specification generated for the modification or in the qualification testing during the dedication of the components which were purchased as commercial grade.

The violation, which is described in the enclosed Notice of Violation and Proposed Imposition of Civil Penalty (Notice), involved the failure to implement adequate design controls when electro-mechanical relays in the EDG load sequencers were replaced with microprocessor based relays in 1990. The failure to establish measures for the selection and review for suitability of applications for parts essential to the safety-related functions of components is considered a violation of the requirements of 10 CFR Part 50, Appendix B, Criterion III, Design Control.

The common mode failure of the relays in each of the two emergency trains during a LOCA, coincident with a loss of offsite power, could result in the complete failure of both EDG load sequencers. This condition would prevent the emergency diesel generators from automatically energizing the safety-related loads, thus significantly reducing your ability to automatically mitigate the consequences of the accident. Therefore, this violation has been classified at Severity Level III in accordance with the "General Statement of Policy and Procedures for NRC Enforcement Actions," 10 CFR Part 2, Appendix C (Enforcement Policy).

The NRC recognizes that actions were taken to correct these violations and prevent recurrence. These actions included, but were not limited to: (1) a modification of the EDG load sequencers to reduce the magnitude of the voltage spike by installing suppression diodes; (2) sequencer reliability testing; (3) industry notification of the event; (4) an evaluation of your capability to identify and specify modification tests to detect functional degradation, and providing Engineering Assurance and System Engineering review of modification packages, including post-modification testing, until completion of the evaluation; (5) developing engineering guidance to address engineering requirements for the application of digital solid state components as replacements for non-digital components; (6) reviewing similar design change packages performed over the past five years involving commercially dedicated digital solid state replacements; and (7) reviewing test control and troubleshooting practices.

Notwithstanding those corrective actions, to emphasize the importance of (1) proper control of equipment at the facility to assure that systems designed to mitigate serious safety events are able to perform their intended safety function; and (2) proper design control associated with safety related equipment to assure modifications do not degrade such equipment, I have been authorized, after consultation with the Director, Office of Enforcement, to issue the enclosed Notice of Violation and Proposed Imposition of Civil Penalty (Notice) in the amount of \$50,000 for the violation set forth in the enclosed Notice.

The base civil penalty amount for a Severity Level III violation is \$50,000. The application of the escalation and mitigation factors set forth in the enforcement policy, on balance, did not result in any adjustment to the civil penalty. The violation was self-disclosing in that the surveillance test results clearly indicated the deficiency. However, because of your initiatives in identifying the root causes of the violation, 25% mitigation, as allowed by the enforcement policy, is warranted. Although your immediate corrective actions in restoring plant safety were prompt and the longer term corrective actions are considered comprehensive in addressing the appropriate issues, some inadequacies were demonstrated during the development of the corrective actions. Troubleshooting was not always well controlled and documented, and on two occasions resulted in damage to the relay under evaluation. Additionally, the suppression diodes installed on the auxiliary relays caused the auxiliary feedwater pump to start at the wrong sequence step. This showed that your short term corrective actions were narrowly focused on the specific design issue and not on the broad area of concern (i.e., design control). Hence, only 25% mitigation, rather than 50% as allowed by the enforcement policy, is warranted on this factor.

In addition to a Category 2 rating in the engineering/technical support areas during the last SALP period, you have received a Severity Level III violation and a civil penalty of \$75,000 (Ref: EA-92-085, dated June 17, 1992), and several Severity Level IV violations, in the past two years, dealing with engineering related problems. Additionally, the last escalated enforcement action (EA-92-085) also involved a failure of the load sequencer in 1992 and was attributed to weak design control. Based on this enforcement history in the area of concern, 50% escalation of the base civil penalty on this factor is warranted. Although the violation existed since 1990, an escalation based on duration was not considered warranted to reflect any added significance. The other factors were considered and no further adjustments were considered warranted.

You are required to respond to this letter and should follow the instructions specified in the enclosed Notice when preparing your response. In your response, you should document the specific actions taken and any additional actions you plan to prevent recurrence. After reviewing your response to this Notice, including your proposed corrective actions and the results of future inspections, the NRC will determine whether further NRC enforcement action is necessary to ensure compliance with NRC regulatory requirements.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be placed in the NRC Public Document Room.

The responses directed by this letter and the enclosed Notice are not subject to the clearance procedures of the Office of Management and Budget as required by the Paperwork Reduction Act of 1980, Pub. L. No. 96-511.

Sincerely,

Original Signed by:
Thomas T. Martin

Thomas T. Martin
Regional Administrator

Enclosure:
Notice of Violation and Proposed
Imposition of Civil Penalty

cc w/encl:
G. Thomas, Vice President, Nuclear Services
D. Sperry, Vice President, Nuclear Operations
L. Freeland, General Manager, Nuclear Operations Unit
K. Grada, Manager, Quality Services Unit
N. Tonet, Manager, Nuclear Safety Department
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