

# Duquesne Light Company

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November 18, 1993  
NPD3VPS:0036

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

Subject: Beaver Valley Power Station, Unit No. 2  
Docket No. 50-412, License No. NPF-73  
Confirmatory Action Letter 1-93-020

In accordance with your Confirmatory Action Letter dated November 9, 1993, we have complied with the following specified actions:

- 1) Quarantine and suspend testing of relays and components, which may have caused the failure of the emergency diesel generator load sequencers, until resumption is authorized by Mr. Trapp, Augmented Inspection Team (AIT) Team Leader.
- 2) Maintain Unit 2 in Cold Shutdown Mode until authorization is received from the Regional Administrator, NRC Region I.

The specific issues being addressed by the AIT are the potential for a common mode failure of the BV-2 Diesel Generator load sequencer circuitry, the possible generic implications that may exist for the design and operation of the relays used in the sequencer circuit, and the need to understand the root cause(s) of these failures.

A detailed review of the Diesel Generator load sequencer failure has been completed by a Site Response Team under the direction of T. P. Noonan, General Manager of Nuclear Engineering and Safety Unit. Since the arrival of the AIT and the subsequent lifting of the quarantine on testing of relays and components, the following actions have been accomplished:

1. Extensive bench and in-situ testing was conducted to determine the failure modes of the diesel generator load sequencer circuitry and to develop appropriate corrective actions. The testing included the following:
  - Bench tests were conducted of simulated relay timer circuits
  - In-situ circuit tests were used to validate bench test results
  - Comprehensive laboratory testing was performed to identify potential failure mechanisms
  - Multiple in-situ reliability tests were performed to validate proposed circuit modifications
2. Vendor qualification reports were reviewed to validate their applicability to our specific circuit configuration.
3. A root cause of the event was performed by a multi-disciplined task group under the Independent Safety Evaluation Group.
4. A modification was developed and implemented for the EDG sequencer circuits via minor Design Change Package No. 2057. This modification consisted of the addition of a voltage suppressor to the ASEA RXMH2 relays which are connected to the ATC 365A timers in the sequencer circuit and an alteration to the Step 4 timer circuit.
5. Reliability and operability testing was performed on the revised circuitry to confirm that it operated in accordance with design requirements. Technical Specification required surveillance testing was successfully completed in accordance with surveillance testing procedures OST 2.36.3 and 2.36.4 for Diesel Generator 2-1 and 2-2, respectively.
6. Other solid state relay replacement components in Class 1E circuits that have been qualification tested have been evaluated to verify that they are qualified for their specific application.

The root cause of the diesel generator load sequencer failure has been addressed during the course of implementing DCP 2057. In addition, the following corrective actions will be taken:


1. An ATC 365A timer relay will be sent to the manufacturer for failure analysis.
2. An evaluation of our organization's capability to identify and specify modification tests which detect functional degradation of modified equipment will be conducted. Until completion of the evaluation, Engineering Assurance and System Engineers will review modification packages prior to installation and concur with the modification testing requirements.
3. Engineering guidelines will be developed which address engineering requirements for the application of digital solid state components as replacements for non-digital components.

The above information has been discussed with the members of the AIT during the evolution of the testing and modification activities and was summarized in a conference call on the afternoon of Wednesday, November 17, and a meeting on the afternoon of Thursday, November 18.

As a result of extensive bench and in-situ testing of the ATC timer circuitry and appropriate analysis, we have concluded that the circuit modifications as described above will adequately address the failure of the diesel generator load sequencer and other potential failure modes resulting from voltage spikes induced in the circuitry. With the completion of these activities, we believe that we have met the full intent of your Confirmatory Action Letter and hereby formally request approval to proceed with the Beaver Valley Unit 2 plant restart.

If there are any questions concerning this response, please contact Mr. Nelson Tonet at (412) 393-5210.

Sincerely,

  
George S. Thomas

cc: Mr. T. T. Martin, NRC Region I Administrator  
Mr. L. W. Rossbach, Sr. Resident Inspector  
Mr. G. E. Edison, Project Manager  
Mr. J. C. Linville, Chief, Project Branch No. 3  
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