UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

October 13, 1988

Docket Nos: 50-237, 249, 254 and 265

Mr. Henry E. Bliss
Nuclear Licensing Manager
Commonwealth Edison Company
P.O. Box 767
Chicago, IL 60609

Dear Mr. Bliss:

SUBJECT: EFFECT OF POSTULATED DC POWER FAILURE ON ECCS FUNCTIONALITY (TAC NOS. 67046, 67047, 67048, AND 67049)

Re: Dresden Nuclear Power Station, Units 2 and 3, Quad Cities Nuclear Power Station, Units 1 and 2

By letter dated February 19, 1988 from J. A. Siladay to T. E. Murley, Commonwealth Edison Company (CECo) provided detailed descriptions of, and implementation schedules for, a design modification to the Low Pressure Coolant Injection (LPCI) swing bus automatic transfer scheme installed at Dresden (Units 2&3) and Quad Cities (Units 1&2). CECo had determined that both stations were vulnerable to a DC control power failure scenario similar to an event first identified and reported by the Enrico Fermi 2 plant.

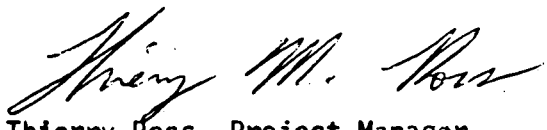
NRC staff reviewed the design modifications and implementation schedules proposed by CECo for the LPCI swing bus. We concluded that the proposed modifications will correct existing design deficiencies and are, therefore, acceptable. Furthermore, we determined that the proposed implementation dates are also acceptable. Our Safety Evaluation Report (SER) is provided in Enclosure 1.

In addition to correcting design deficiencies of the LPCI swing bus, CECo conducted several studies to confirm the design modifications. These studies involved the following: 1) breaker fault coordination of the swing bus, 2) impact of battery system (24/48V, and 125V, and 250V DC) failures on Emergency Core Cooling System (ECCS) availability, 3) failure modes and effects analysis of the modified swing bus automatic transfer design, and 4) comparison of the Enrico Fermi 2 swing bus design to Quad Cities and Dresden. CECo documented their commitments for conducting these additional studies in Appendix D of the February 19, 1988 letter. These studies have been submitted in letters dated May 13, 1988, June 21, 1988 and July 8, 1988 and are under review by the staff. Acceptance of the design modifications is not contingent upon completion of this review. However, we do expect to receive further information from CECo that will correlate the findings and conclusions of the battery system failure/ECCS availability study (of Quad Cities Unit 1) with the plant specific configurations of Quad Cities Unit 2 and Dresden Units 2&3. This correlation should be provided on a timely basis, but no later than the implementation schedule for modification of each unit.

As a separate, but inter-related issue, the NRC staff also completed an evaluation regarding the applicability of passive electrical failures (especially DC power supply failures) upon required analyses of ECCS performance during a Design Basis Accident (DBA). From this evaluation, we determined that the loss of any one DC power supply must be included as one of the possible single failures in the analyses for the design basis Loss of Coolant Accident (LOCA) in order to establish compliance with the requirements of 10 CFR Part 50.46. Such an analysis had been provided for Quad Cities Unit 1 in the Cycle 10 Reload Report, and approved by NRC SER dated December 15, 1987. But this report was subsequently withdrawn and replaced by CECo, in the aforementional February 19, 1988 letter, with an analysis that did not recognize passive electrical failures. Since then, we've determined that the replacement SAFER/GESTR LOCA Analysis Report, Revision 1 (dated January 1988), submitted for Quad Cities, Unit 1, does not acceptably address the consequences of single failures on the capability of ECCS during a DBA (this determination also applies to the previous LOCA analyses for Quad Cities Unit 2 and Dresden 2&3). Our SER is included as Enclosure 2 to this letter.

In conclusion, we request CECo to provide revised LOCA analyses that also assume a single passive failure of any electrical power supply (e.g. DC batteries) for the Dresden and Quad Cities stations. These revised analyses for each of the Dresden and Quad Cities units shall be submitted to us prior to startup from the next scheduled refueling outage for each respective unit.

Sincerely,



Thierry Ross, Project Manager
Project Directorate III-2
Division of Reactor Projects - III,
IV, V and Special Projects
Office of Nuclear Reactor Regulation

Enclosure:
As stated

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In conclusion, we request CECo to provide revised LOCA analyses that also assume a single passive failure of any electrical power supply (e.g. DC batteries) for the Dresden and Quad Cities stations. These revised analyses for each of the Dresden and Quad Cities units shall be submitted to us prior to startup from the next scheduled refueling outage for each respective unit.

Sincerely,

Thierry Ross, Project Manager
Project Directorate III-2
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The NRC staff has also completed an evaluation of the applicability of DC power supply failures upon ECCS performance. Our SER is included as Enclosure 2 to this letter. In this SER, we determined that the loss of a DC power supply must be included as one of the possible single failures in the analyses for the design basis Loss of Coolant Accident (LOCA) in order to establish compliance with the requirements of 10 CFR Part 50.46. Such an analysis had been provided for Quad Cities Unit 1 in the Cycle 10 Reload Report, but was subsequently withdrawn and replaced by CECo with an analysis that did not recognize passive electrical failures. Since then, we've determined that the replacement SAFER/GESTR LOCA Analysis Report, Revision 1 (dated January 1988), submitted by the February 19, 1988 letter, for Quad Cities, Unit 1, does not acceptably address the consequences of single failures on the capability of ECCS during a design basis accident (this determination also applies to the previous LOCA analyses for Quad Cities Unit 2 and Dresden 2&3).

In conclusion, we request CECo to provide revised LOCA analyses also that assume a single passive failure of any electrical power supply (e.g. DC batteries) for the Dresden and Quad Cities stations. These revised analyses for each of the Dresden and Quad Cities units shall be submitted to us prior to startup from the next scheduled refueling outage for each respective unit.

Sincerely,

Thierry Ross, Project Manager
Project Directorate III-2
Division of Reactor Projects - III,
IV, V and Special Projects
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The NRC staff has also completed an evaluation of the applicability of DC power supply failures upon analyses used to confirm the adequacy of ECCS cooling performance. Our SER is included as Enclosure 2 to this letter. In this SER, we determined that the loss of a DC power supply must be included as one of the possible single failures in the analyses for the design basis Loss of Coolant Accident (LOCA). Furthermore, these analyses must also take into consideration existing LPCI swing bus design deficiencies, until such time as proposed modifications are implemented to correct identified design flaws. Since such analyses have not been submitted to us, the staff concludes that Quad Cities and Dresden stations may not be in full compliance with the requirements of 10 CFR 50.46. Similarly we've concluded that the SAFER/GESTR LOCA Analysis Report, Revision 1 (dated January 1988), submitted by the February 19, 1988 letter, for Quad Cities, Unit 1, does not acceptably address the consequences associated with single failures of DC power supplies upon availability of ECCS (this conclusion also applies to comparable LOCA analyses for other Dresden and Quad Cities units). Consequently, CECo must establish compliance with 10 CFR 50.46 for both stations by performing, documenting, and submitting to the NRC staff additional LOCA analyses that address single failure of any DC battery with and without the LPCI swing bus design flaw, as applicable. However, because the time period prior to completion of planned modifications is limited, CECo may choose to request an exemption from conducting those LOCA analyses of ECCS cooling performance which include consideration of the LPCI swing bus design deficiency.

Within thirty days after receipt of this letter, CECo is requested to submit a schedule for providing us with revised LOCA analyses that assume single failure of any DC power supply for the Dresden and Quad Cities stations. These revised analyses will also account for the LPCI swing bus design flaw, unless: 1) Corrective modifications are complete (e.g. Quad Cities, Unit 2), or 2) CECo requests an exemption from 10 CFR 50.46 for analyzing ECCS performance capability without assuming the swing bus design flaw exists.

Sincerely,

Thierry Ross, Project Manager
Project Director III-2 + Directorate
Division of Reactor Projects - III,
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