Commonwealth Edison
One First National Plaza, Chicago, Illinois
Address Reply to: Post Office Box 767
Chicago, Illinois 60690

October 18, 1985

Mr. Harold R. Denton, Director
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Subject: NUREG 1032 "Station Blackout"

Dear Mr. Denton:

In reviewing the NUREG, it is evident that a substantial amount of research and data gathering was involved. This work has contributed to a better understanding of the blackout issue, but further research and NRC-Utility dialogue is required to ascertain that correct conclusions are being reached. In particular, further review of the correlation between wind, ice, and snow and loss of offsite power is needed as well as the basis for the diesel generator reliability numbers used in the study.

We believe that there is no substantial basis, at this time, upon which to proceed with rulemaking. Also, any rulemaking should be delayed until other power-related issues are resolved. Those issues (B-56 DG Reliability, G.I.-23 RCP Seals, USI A-45 Shutdown Decay Heat Removal and A-30 DC Power Supplies) should not be solved independently; an integrated resolution is both cost effective and technically achievable.

We believe that the present EOP's, which are based on symptoms, provide adequate guidance to the operators to deal with Station Blackout. Any additional procedures which could be required by a rulemaking would be event oriented and contrary to the existing EOP philosophy.

The evaluation for determining whether a rulemaking is still required should include the current industry trends and a new cost-benefit analysis for proposed Station Blackout requirements. Previous cost benefit analyses for other rulemakings have been overly optimistic.

We endorse the comments submitted by the Nuclear Utility Group on Station Blackout (NUGSBO). In addition, Attachment 1 to this letter contains specific comments on the NUREG-1032 study.

Sincerely,

Greg Alexander

Greg Alexander
Nuclear Licensing Administrator

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Attachment
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Attachment

Comments on Appendix A, NUREG 1032, draft of May 1985

1. The list of plant centered losses of offsite power in Table A.4 is inconsistant with NSAC/80. Several events are improperly included, while two were omitted, as listed below.

   a. The Fitzpatrick outage of 10/4/78 is not shown in reference 13; it was included in a predecessor to EPRI report, NP-2301.

   b. The following events are shown as categories III or IV which do not qualify as a loss of offsite power.

      I. Oconee - 1/4/74
      II. Fitzpatrick - 3/27/79
      III. Davis Besse - 11/29/77
      IV. Point Beach - 4/27/74

   c. The Indian Point outage of 6/3/80 was included in the data for two different design groups, once with a hypothetical duration.

   d. Palisades outages on 11/25/77 and 12/11/77 were incorrectly excluded as recurring failures.

2. Two events at Quad Cities were improperly listed as losses of offsite power in NSAC/80 and Table. A.4; they are listed as category III in NSAC/85, a corrected and updated report from the same source.

3. Five grid related events of 30 minutes or greater duration are listed in Table A.5 but a total of 4 is given in Table A.1. In addition, the Indian Point outage of 11/19/65 was classified as Ia - over 30 minutes - in NSAC/80, so the total should probably be six.

4. Three of the "major partial losses" in Table A.7 are not in reference 13. (Browns Ferry - 3/1/80; San Onofre - 2/24/69; Arkansas Nuclear One - 2/22/75). Inclusion of any "partial losses of offsite power" (Category II or III event) is neither justified nor consistant with the derivation of other frequencies elsewhere in Appendix A.

5. The labels of curves SR3 and SR5 are interchanged in Figure A.8.

6. The right hand vertical axis of Figure A.2.a is based on a total frequency of plant centered events of 0.056 per year, but discussion on page A-12 acknowledges that a frequency of 0.040 per year can be justified based on current experience.

7. The Weibull distribution is assumed for loss of off-site power (LOOP) durations without explaining why it is more appropriate than such alternatives as the gamma and log-normal distributions. The parameters estimated from the data points are not given, nor is the method of estimation shown.

(Applied Life Data Analysis, by Wayne Nelson, gives formulas for estimation on pages 229-231). No measure of the fit of data points to the estimated Weibull distribution is given, and the fit for category I4 in Figure A.2b seems especially poor.

8. The classification of design factors relating to the number of preferred power sources after automatic transfer has been redefined (Table A.2). However, no plant-centered LOOP event was reclassified (Table A.4). Unless this is an oversight, there may be inadequate basis for distinguishing design groupings B2a and B2b.

9. On page 9 of the July 11, 1984 draft it is noted that the three switchyard design groups (A1, A2, A3) can be maintained if desired. As connections of multiple switchyards "electrically connected at the site" are typically those (autotransformer, normally open bus tie) which provide a high degree of assurance against common problems affecting both switchyards, we believe the three groups should be recognized as separate.

10. The model for severe weather considers only exposure to weather hazards in predicting loss of offsite power. It thus fails to account for number of lines and diversity of rights of way which would materially affect such frequency, particularly as attention is confined to Category Ia events. Such events imply a far more severe storm (extremely severe weather) affecting substantially all transmission terminating at the plant.

11. A LOOP is unlikely to be caused by snowfall which is used as an indicator of cold weather. Freezing rain, which is poorly correlated with snowfall, is a more frequent cause of transmission outages. Furthermore, the scope of NUREG CR-2890 is extreme wind speeds at fixed reporting locations, not major wind storms such as tornadoes and hurricanes. Wind speeds in the 80-100 mph range, which are predicted once in 100 years by CR-2890, are somewhat less than the design strength of Edison transmission lines.

12. The only complete LOOP caused by a tornado was at Dresden in 1965, when all lines to the site were on a common right of way. This seems to be a "latent design flaw which has since been eliminated," in the words used on page A-8 to justify omission of the Calvert Cliffs outage.

13. No explanation of the categories of Extremely Severe Weather shown in Table A.9 is provided, nor are the classifications of any specific plants indicated. We cannot evaluate this analysis.

14. On page A-35, sites other than Florida are classified in grid failure classifications GR1 and GR2. As these relate to demonstrated enhanced recovery procedures, GR5 and GR6 were probably meant.