**Commonwealth Edison**
72 West Adams Street, Chicago, Illinois
Address Reply to: Post Office Box 767
Chicago, Illinois 60690 - 0767

November 20, 1989

Director of Nuclear Reactor Regulation
US Nuclear Regulatory Commission
Mail Station P1-137
Washington, DC 20555

Subject: Zion Nuclear Power Station, Unit 1
License No. DPR-39
NRC Docket No. 50-295
Steam Generator Girth Weld Inspection

Reference: (a) November 16, 1989, telephone conversation between NRR/CECo personnel

Gentlemen:

During the recent Zion Unit 1 refueling outage, ultrasonic examinations were performed on the steam generator D upper shell to transition cone girth weld. During the course of these examinations, indications were detected which exceeded the allowable standards of IWC-3000 (table IWB-3511-1). The total population of indications included both surface and subsurface reflectors. Based upon these results, the extent of the ultrasonic examinations was expanded to include the girth weld in steam generator C. Based upon the indications found in steam generator C, the examinations were expanded to include steam generators A and B.

All the UT surface indications confirmed by magnetic particle testing were removed by grinding and blending. Complete removal of all surface indications was verified by MT. The remaining embedded indications which exceeded 50% of DAC were dispositioned by fracture mechanics to demonstrate their acceptance by the criteria of the ASME Code, Paragraph IWB-3600.

The following table describes the bounding subsurface indication in each generator (all dimensions in inches):

| Generator | Ind | 2a Dim | l Dim | S Dim | Y Dim | a/l | a/t(%) |
|---|---|---|---|---|---|---|---|
| A | 13 | 0.06 | 0.80 | 0.58 | 1.0 | 0.38 | 8.2 |
| B | 2 | 0.37 | 1.70 | 0.52 | 1.0 | 0.11 | 5.1 |
| C | 9 | 0.35 | 0.50 | 1.48 | 1.0 | 0.35 | 4.7 |
| D | 32 | 0.47 | 0.625 | 0.45 | 1.0 | 0.38 | 6.4 |



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The preceeding indications as well as all embedded indications which exceeded the standards of table IWB-3511-1 (1980 Code, 1981 Addison) were subjected to a fracture evaluation, using the guidelines of Appendix A of Section XI. The analyses completed were specific to the Zion steam generator girth welds. The detailed technical basis behind these analyses will be submitted separately, but the approach was the same as that used for the flaw evaluation handbook submitted earlier for the Byron and Braidwood steam generators and pressurizers. A complete description and details may be found in Westinghouse WCAP-11063, "Background and Technical Basis, Handbook on Flaw Evaluation, Byron and Braidwood Units 1 and 2" by Y.S. Lee and W.H. Bamford.

The flaw evaluations completed for Zion Unit 1 have been based on a stress analysis performed with the same care and considerations as that performed for Indian Point 2. The conclusion reached was that the indications are all acceptable by a wide margin.

Commonwealth Edison has also committed to perform a more extensive examination of the "boat" specimens that were retrieved during our inspection of the steam generators. The initial results of this metallography may be available by mid-December, however, the results will not be finalized until the work is completed by Stanford Research. We will be available to review the results of this analyses with your personnel when the analyses of the data is complete.

Please direct any questions that you may have regarding this matter to this office.

Very truly yours,

Glenn E. Trzyna

G.E. Trzyna
Nuclear Licensing Administrator

cc: Chandu Patel-NRR
R.A. Hermann-NRR
Senior Resident Inspector-Zion

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