SOUTHERN CALIFORNIA EDISON
An EDISON INTERNATIONAL™ Company

J. L. Rainsberry
Manager, Plant Licensing

September 22, 1997

U. S. Nuclear Regulatory Commission
Document Control Desk
Washington, D.C. 20555

Gentlemen:

Subject: **Docket Nos. 50-361 and 50-362**
Station Batteries
San Onofre Nuclear Generating Station Units 2 and 3

Reference: Letter from Walter C. Marsh (SCE) to the Document Control Desk (NRC), Dated June 4, 1996; Subject: Docket Nos. 50-361 and 50-362, Station Batteries, San Onofre Nuclear Generating Station, Units 2 and 3

This letter provides additional information on the station batteries as a follow-up to the referenced letter dated June 4, 1996. Southern California Edison (SCE) is submitting this letter to inform the NRC that, based on results from recent testing, the station batteries have adequate capacity to meet their design function. SCE has determined that neither battery derating nor battery replacement is warranted.

BACKGROUND

On May 9, 1996, the NRC requested information concerning the results of surveillance testing of several banks of Class 1E station batteries during the Cycle 8 refueling outages. The referenced June 4, 1996, letter emphasized that the battery banks in question had not lost capacity, were operable, and would perform all required safety functions. These conditions remain true today. The referenced letter also committed to additional testing to identify any premature loss of capacity and to revising the battery sizing calculations if warranted. SCE's evaluation for long term battery performance is detailed below.

DISCUSSION

Test results from the Cycle 8 refueling outages indicated that three banks of Exide 2GN-15 cells manufactured in 1992 may have lost capacity. Subsequent investigations determined that banks 2D1, 3D1, and 3D2 had not lost capacity, however the manufacturer's ampere ratings for discharge periods longer than

A201
1/0

San Onofre Nuclear Generating Station
P. O. Box 128
San Clemente, CA 92674-0128
714-368-7420

9709230016 970922
PDR ADOCK 05000361
P PDR

two hours were overstated. Battery capacity based on test intervals greater than two hours were 10-15 percent lower than those of the original two hour factory acceptance tests. The manufacturer (Exide) completed comprehensive discharge tests and dissection and internal examination of some sample cells to support these conclusions. Exide has not published a root cause report to date.

SCE committed to performing discharge performance tests between Cycle 8 and 9 refueling outages on spare cells of the banks in question. The results of the tests on the spare cells revealed a minimum capacity of 95 percent of the manufacturer's published four hour rating. Cycle 9 refueling outage four hour performance discharge tests on battery banks 2D1 and 3D2 resulted in measured capacities of 96.67 percent and 93.33 percent of the four hour rating, respectively. The performance tests indicate an increase of approximately 3 percent over previous Cycle 8 refueling outage test results. The increase in capacity is consistent with normal expectations. During the first few years of service, the combination of continuous float operation and periodic cycling conditions the new battery and results in an increase in capacity. In addition, service tests with additional ampere margins on the accident load profile were completed satisfactorily. These banks exhibit an increasing trend in capacity, and the four hour capacity of these cells is expected to plateau somewhere between 95-100 percent of the rated capacity.

The accident load profile for these Class 1E Battery Banks is 90 minutes. The battery cells are sized and procured in accordance with IEEE 485 to be approximately 28 percent larger than needed for the required accident profile. This means the battery would be operable at 80 percent of the manufacturer's rating because we would expect to meet 100 percent of the load profile. The Station Blackout (SBO) profile is four hours, and SCE has opted to use the four hour rating as a criterion for the performance tests. The existing cells are also 28 percent larger than required for the SBO load profile. The battery cells as tested individually meet 100 percent of the published vendor ampere-hour rating for the two hour discharge based on the factory acceptance test and when taken as an average meet approximately 95 percent for the four hour discharge. Technical Specification Surveillance 3.8.4.8 acceptance criteria require the battery capacity to be equal or greater than 80 percent of the manufacturer's rating and would require annual performance testing if the batteries show degradation (a decline of more than 10 percent over previous results) or have reached 85 percent of expected life. In this case, both measured capacity values indicate that the existing battery cells, which are currently 28 percent larger than required for the existing load profiles, are adequate.

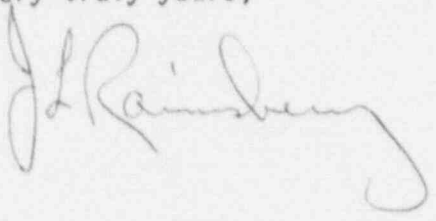
By the referenced letter SCE committed to obtain revised curves from Exide to account for reduced ampere hours at the longer discharge rates and use this information to derate the batteries. However, based on the test results described above, SCE has chosen not to reflect this new data in the calculations at this time. Should battery capacity increase as expected in future years, battery derating would not be warranted.

CONCLUSION

Based on the above testing and evaluations, SCE does not consider that any additional corrective actions, evaluations or special testing is required. SCE will continue to monitor station battery banks as required by the Technical Specification Surveillance Requirements. SCE retains the results of battery testing at the San Onofre site and these results are available for NRC review.

If you have any questions on this subject, please call me.

Very truly yours,



cc: E. W. Merschoff, Regional Adminsitrator, NRC Region IV
K. E. Perkins, Jr., Director, Walnut Creek Field Office, NRC Region IV
M. B. Fields, NRC Project Manager, San Onofre Units 2 and 3
J. A. Sloan, NRC Senior Resident Inspector, San Onofre Units 2 & 3