September 25, 1992

Docket Nos. 50-361
and 50-362

Mr. Harold B. Ray
Senior Vice President
Southern California Edison Co.
Irvine Operations Center
23 Parker Street
Irvine, California 92718

Mr. Edwin A. Guiles
Vice President
Engineering and Operations
San Diego Gas & Electric Co.
101 Ash Street
San Diego, California 92112

Gentlemen:

SUBJECT: WYLE TEST REPORT ON SEISMIC TESTING OF EXIDE BATTERIES

The attached letter is being provided for your use in the future for evaluating the operability of any aged and cracked Exide batteries installed at San Onofre, Units 2 and 3. It is the staff's understanding that all battery cells with cracked covers at San Onofre, Units 2 and 3, have been removed from service.

This letter, sent to Arizona Public Service Company, contains the results of the staff's review of the Wyle test report on seismic testing of aged and cracked Exide batteries. The staff concluded that the Wyle test had neither demonstrated the seismic qualification of aged and cracked batteries, nor provided an adequate justification for their continued service. The staff notes that this Wyle test report has been used in the past to justify continued operation of San Onofre, Units 2 and 3, when some of the older design Exide batteries contained in banks 2D1, 3D1, and 3D2 developed cracks in their covers. Because of the deficiencies identified by the staff in the Wyle test report, operability of aged and cracked Exide batteries of the type identified above should not be based on this Wyle test report alone. No new requirements are being established and no specific action or written response is required. If you have any questions, please contact me at (301) 504-3062.

Sincerely,

Original signed by

Mel B. Fields, Project Manager
Project Directorate V
Division of Reactor Projects III/IV/V
Office of Nuclear Reactor Regulation

Enclosure:
9/22/92 ltr to APS

cc w/enclosure:
See next page

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

September 25, 1992

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and 50-362

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Sincerely,

Mel B. Fields

Mel B. Fields, Project Manager
Project Directorate V
Division of Reactor Projects III, IV/V
Office of Nuclear Reactor Regulation

Enclosure:
9/22/92 ltr to APS

cc w/enclosure:
See next page

Messrs. Ray and Guiles
Southern California Edison Company

San Onofre Nuclear Generating
Station, Unit Nos. 2 and 3

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ENCLOSURE

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

September 22, 1992

Docket Nos. 50-528, 50-529
and 50-530

Mr. William F. Conway
Executive Vice President, Nuclear
Arizona Public Service Company
Post Office Box 53999
Phoenix, Arizona 85072-3999

Dear Mr. Conway:

SUBJECT: COMPLETION OF REVIEW OF WYLE TEST REPORT ON SEISMIC TESTING OF EXIDE BATTERIES - PALO VERDE NUCLEAR GENERATING STATION (TAC NOS. M84132, M84133, AND M84134)

We have completed our review of the "Seismic Simulation Test Program on Six Naturally-Aged Type 2GN Exide Batteries -- Wyle Test Report No. 42679-1." The test report contains the results of simulated seismic tests of six naturally-aged and cracked Exide Type 2GN Batteries subject to the Required Response Spectra (RRS) at the battery location in the Palo Verde Nuclear Generating Station. Although the staff did not conduct a detailed review of the input motion, it appears that the test procedures and the test input adequately follow the IEEE Standard 344-1975, except that the functional operability (voltage, current, etc.) of the batteries was not monitored. The test report concluded that the specimens still possessed some structural integrity to withstand the RRS without causing a catastrophic failure. However, the staff finds the results of the Wyle tests do not provide adequate basis to demonstrate that the aged and cracked batteries provide sufficient capacity and capability to perform their safety function in the event of an earthquake. The staff's rationale for this conclusion is provided in the following discussion.

Large lead storage batteries are used in nuclear power plants as a source of emergency power for vital instrumentation and control systems such as electrical distribution breaker control for engineering safety features, inverters for reactor protection instrument channels, and certain other safety-related equipment. Since safety-related lead storage batteries must meet design specifications throughout the batteries' installed life, the aged and cracked batteries must be qualified to the plant design specifications. In qualifying the aged and cracked battery cells, the batteries must undergo capacity tests to show that the aged and cracked battery cells are capable of performing their safety function before, during, and after a seismic event as delineated in Section 8.3.1.1 of ANSI/IEEE Standard 535. However, these capacity tests were not performed in the subject test program.

A further deficiency was noted in the Wyle test report concerning the lack of acceptance criteria and/or requirements for: (1) monitoring of the electrical functions (such as voltage, current, discharge rate for battery capacity,

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etc.) before, during, and after the tests. Section 6.3.1 of the Wyle test report concluded that "the Batteries were still functioning electrically;" however, the report did not discuss how this determination was made; (2) initiating new cracks and/or propagating existing cracks in the battery cell cover and casing; and, (3) monitoring the acceptable fluid level in the battery cells during and after the test. The Wyle test results indicated that some of the existing cracks in the battery covers propagated and some new cracks appeared. It has also indicated that some battery fluid was lost, but it was unclear whether this loss has affected the electrical function.

Based on the above, the staff concludes that the Wyle test has neither demonstrated the seismic qualification of aged and cracked batteries, nor provided an adequate justification for their continued service. Therefore, batteries with cracks, whether in the cover or in the jar, should be replaced promptly.

Sincerely,

Charles M. Trammell

Charles M. Trammell, Senior Project Manager
Project Directorate V
Division of Reactor Projects III/IV/V
Office of Nuclear Reactor Regualtion

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