



UNITED STATES
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

November 3, 1994

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

SUBJECT: REVISION TO COMPENSATORY ACTIONS REGARDING 125V DC BATTERIES AT PALO VERDE NUCLEAR GENERATING STATION UNIT NO. 2 (TAC NO. M90581)

Dear Mr. Stewart:

The Commission issued Amendment No. 71 to Facility Operating License No. NPF-51 for the Palo Verde Nuclear Generating Station (PVNGS), Unit No. 2, on October 13, 1994. The amendment consist of changes to the Technical Specifications (TS) in response to your application dated October 9, 1994, as supplemented by letter dated October 12, 1994. The amendment modified TS 4.8.2.1.e, "DC Sources - Operating," to specify that the provisions of TS 4.0.1 and 4.0.4 are not applicable to the battery capacity requirements until entry into Mode 4 coming out of the fifth refueling outage or upon any deep discharge cycle of the battery. The amendment was issued on an emergency basis when you discovered that the 125V DC batteries do not meet the TS requirement for minimum battery capacity, thereby precluding PVNGS Unit 2 from changing modes.

The safety evaluation for the amendment defined the compensatory actions to be implemented while the amendment is in effect. One of the defined compensatory actions was that float current of the installed battery trains must be measured on one train each week and the value found to be less than or equal to 500 mA or the batteries were to be declared inoperable. Your testing conducted during the week of October 24, 1994, has determined that accurate float current readings can not be taken on the installed battery trains in accordance with this compensatory action.

Based upon a telephone conversation with NRC staff on October 28, 1994, Arizona Public Service Company (APS) provided supplemental information, dated October 29, 1994, to support a modification of the compensatory actions. The staff has reviewed the revised compensatory actions and finds them acceptable for monitoring battery performance. The enclosure to this letter revises a

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Mr. William L. Stewart

- 2 -

November 3, 1994

portion of the compensatory action section of the staff's safety evaluation dated October 13, 1994.

Sincerely,

Original signed by:

Brian E. Holian, Senior Project Manager
Project Directorate IV-2
Division of Reactor Projects III/IV
Office of Nuclear Reactor Regulation

Docket No. STN 50-529

Enclosure: Revision to October 13,
1994, Safety Evaluation

cc w/encl: See next page

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DOCUMENT NAME: PV90581.LTR

OFC	LA/DRPW <i>DC</i>	PM/PDIV-2	EELB <i>CB</i>
NAME	DFoster-Curseen	BHolian: <i>pk</i>	CBerlinger
DATE	11/3/94	11/3/94	11/03/94

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Mr. William L. Stewart

- 2 -

November 3, 1994

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Sincerely,

Original signed by:

Brian E. Holian, Senior Project Manager
Project Directorate IV-2
Division of Reactor Projects III/IV
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DATE	11/3/94	11/3/94	11/03/94

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Arizona Public Service Company

Palo Verde

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UNITED STATES
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

REVISION TO SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 71 TO FACILITY OPERATING LICENSE NO. NPF-51,

ARIZONA PUBLIC SERVICE COMPANY, ET AL.

PALO VERDE NUCLEAR GENERATING STATION, UNIT NO. 2

DOCKET NO. STN 50-529

On October 13, 1994, Amendment No. 71 to Facility Operating License No. NPF-51 for the Palo Verde Nuclear Generating Station (PVNGS) was issued. The safety evaluation for the amendment defined the compensatory actions to be implemented while the amendment is in effect. One of the defined compensatory actions was that float current of the installed battery trains must be measured on one train each week and the value found to be less than or equal to 500 mA or the batteries were to be declared inoperable. Licensee-performed testing conducted during the week of October 24, 1994, determined that accurate float current readings cannot be taken on the installed battery trains in accordance with this compensatory action. The licensee discussed the test results with the staff on October 28, 1994, and described proposed revised compensatory actions in a letter dated October 29, 1994.

The licensee reported that, because of the configuration of the safety-related 125V DC system at PVNGS, the float current reading taken on the installed Unit 2 batteries contains noise from the battery chargers, which supply power to plant loads under normal operation. The readings are taken using an existing shunt in the battery circuit and a digital volt meter. The voltage value is then converted to amperage based on the known resistance value of the shunt. The installed shunt is sized to read the much higher currents experienced during battery discharge rather than to read the float current. As a result, the float current readings taken at the shunt are masked by noise of a magnitude equal to or greater than the float current, preventing an accurate reading. The licensee cannot modify the installed instrumentation without removing the batteries from service. In response to staff questions regarding Units 1 and 3 measurements, the licensee stated that similar float current results were obtained.

The licensee has stated that, since the battery banks contain both degraded cells and new cells (the 23 new replacement cells and the combined 8 spare cells from Units 1 and 3), the individual cell voltages of the new cells would increase if the degraded cells were drawing an increased float current. This effect is experienced because all cells are connected in series and the new cells would experience the same increased float current as the degraded cells, thereby driving up their individual voltage. The staff agrees that, in lieu of an accurate float current, the individual cell voltage of the new cells will provide a measure of the state of the degraded cells.

Based upon the above information, the licensee proposed to modify the identified compensatory actions for float voltage and float current as follows:

<u>Parameter</u>	<u>Limits/Allowable</u>	<u>Actions to be Taken if Outside Limits</u>
Float Voltage		
All cells	≥ 2.18 volts	Battery inoperable
New cells	≤ 2.35 volts	Battery inoperable
Float Current		
Control cells	≤ 500 mA	Battery inoperable
Installed cells	< 2 amps averaged value	Battery inoperable

The licensee noted in its October 29, 1994, letter that the control cells will consist of cells that have not been subjected to a battery service test. Additionally, the battery service test for the first control group has been deferred until the end of the first week of November, when more testing equipment will arrive. The second service test will be performed in late November in accordance with the staff's safety evaluation for the license amendment.

In effect, three changes have been made to the original compensatory actions: (1) Because of the difficulty of reading ≤ 500 mA on the installed battery cells, the limit was changed to < 2 amps (averaged value); (2) a requirement was added to place a maximum cell float voltage on the new cells (≤ 2.35 volts); and (3) a requirement was added to measure the float current on the control cells. An accurate control cell float current can be taken by the licensee and will provide an indicator that the cells are not experiencing significant time-related degradation. These changes are acceptable to the staff since monitoring will continue to be in place to detect potential battery degradation. The requirement for a 2-amp float current maximum on the installed cells, coupled with a maximum cell voltage reading on the new cells, provides the necessary controls to ensure that battery performance is adequately monitored. These minor revisions to the compensatory actions of the October 13, 1994, safety evaluation do not change the conclusions or no significant hazards determination of the original evaluation.

Principal Contributor: B. Holian

Date: November 3, 1994