

March 6, 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: ISSUANCE OF AMENDMENTS FOR THE PALO VERDE NUCLEAR GENERATING STATION
UNIT NO. 1 (TAC NO. M82350), UNIT NO. 2 (TAC NO. M82351), AND UNIT
NO. 3 (TAC NO. M82352)

The Commission has issued the enclosed Amendment No. 59 to Facility Operating License No. NPF-41, Amendment No. 46 to Facility Operating License No. NPF-51, and Amendment No. 32 to Facility Operating License No. NPF-74 for the Palo Verde Nuclear Generating Station, Unit Nos. 1, 2, and 3, respectively. The amendments consist of changes to the Technical Specifications in response to your application dated December 26, 1991.

These amendments revise the technical specifications to allow replacement of existing 125 V dc batteries with new batteries.

A copy of the related Safety Evaluation is also enclosed. A notice of issuance will be included in the Commission's next regular biweekly Federal Register notice.

Sincerely,

Original signed by Charles M. Trammell
Charles M. Trammell, Sr. Project Manager
Project Directorate V
Division of Reactor Projects III/IV/V
Office of Nuclear Reactor Regulation

Enclosures:

1. Amendment No. 59 to NPF-41
2. Amendment No. 46 to NPF-51
3. Amendment No. 32 to NPF-74
4. Safety Evaluation

DISTRIBUTION

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CTrammell	TQuay
OGC	DHagan
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DOCUMENT NAME: PV82350.AMD

OFC	LA:PDV DRPW	PM:PDV:DRPW	PM-PDV:DRPW	OGC	D:PDV:DRPW
NAME	DFoster	CThompson:pm	CTrammell		TQuay
DATE	2/24/92	2/24/92	2/24/92	2/27/92	3/6/91

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

March 6, 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: ISSUANCE OF AMENDMENTS FOR THE PALO VERDE NUCLEAR GENERATING STATION
UNIT NO. 1 (TAC NO. M82350), UNIT NO. 2 (TAC NO. M82351), AND UNIT
NO. 3 (TAC NO. M82352)

The Commission has issued the enclosed Amendment No. 59 to Facility Operating License No. NPF-41, Amendment No. 46 to Facility Operating License No. NPF-51, and Amendment No. 32 to Facility Operating License No. NPF-74 for the Palo Verde Nuclear Generating Station, Unit Nos. 1, 2, and 3, respectively. The amendments consist of changes to the Technical Specifications in response to your application dated December 26, 1991.

These amendments revise the technical specifications to allow replacement of existing 125V dc batteries with new batteries.

A copy of the related Safety Evaluation is also enclosed. A notice of issuance will be included in the Commission's next regular biweekly Federal Register notice.

Sincerely,

A handwritten signature in cursive script that reads "Charles M. Trammell".

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

Enclosures:

1. Amendment No. 59 to NPF-41
2. Amendment No. 46 to NPF-51
3. Amendment No. 32 to NPF-74
4. Safety Evaluation

cc w/enclosures:
See next page

Mr. William F. Conway
Arizona Public Service Company

Palo Verde

cc:

Nancy C. Loftin, Esq.
Corporate Secretary & Counsel
Arizona Public Service Company
P. O. Box 53999, Mail Station 9068
Phoenix, Arizona 85072-3999

Jack R. Newman, Esq.
Newman & Holtzinger, P.C.
1615 L Street, N.W., Suite 1000
Washington, D.C. 20036

James A. Beoletto, Esq.
Southern California Edison Company
P. O. Box 800
Rosemead, California 91770

Curtis Hoskins
Executive Vice President and
Chief Operating Officer
Palo Verde Services
2025 N. 3rd Street, Suite 220
Phoenix, Arizona 85004

Senior Resident Inspector
U.S. Nuclear Regulatory Commission
HC-03 Box 293-NR
Buckeye, Arizona 85326

Roy P. Lessey, Jr., Esq.
Bradley W. Jones, Esq.
Arkin, Gump, Strauss, Hauer and Feld
El Paso Electric Company
1333 New Hampshire Ave., Suite 400
Washington, D.C. 20036

Regional Administrator, Region V
U. S. Nuclear Regulatory Commission
1450 Maria Lane
Suite 210
Walnut Creek, California 94596

Mr. Charles B. Brinkman, Manager
Washington Nuclear Operations
ABB Combustion Engineering Nuclear Power
12300 Twinbrook Parkway, Suite 330
Rockville, Maryland 20852

Mr. William A. Wright, Acting Director
Arizona Radiation Regulatory Agency
4814 South 40 Street
Phoenix, Arizona 85040

Chairman
Maricopa County Board of Supervisors
111 South Third Avenue
Phoenix, Arizona 85003



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

ARIZONA PUBLIC SERVICE COMPANY, ET AL.

DOCKET NO. STN 50-528

PALO VERDE NUCLEAR GENERATING STATION, UNIT NO. 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 59
License No. NPF-41

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by the Arizona Public Service Company (APS or the licensee) on behalf of itself and the Salt River Project Agricultural Improvement and Power District, El Paso Electric Company, Southern California Edison Company, Public Service Company of New Mexico, Los Angeles Department of Water and Power, and Southern California Public Power Authority dated December 26, 1991, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act) and the Commission's regulations set forth in 10 CFR Chapter I;
 - B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;
 - C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;
 - D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and
 - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.
2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C(2) of Facility Operating License No. NPF-41 is hereby amended to read as follows:

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(2) Technical Specifications and Environmental Protection Plan

The Technical Specifications contained in Appendix A, as revised through Amendment No. 59, and the Environmental Protection Plan contained in Appendix B, are hereby incorporated into this license. APS shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan, except where otherwise stated in specific license conditions.

3. This license amendment is effective as of the date of issuance and must be fully implemented no later than 45 days from the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION



Theodore R. Quay, Director
Project Directorate V
Division of Reactor Projects III/IV/V
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Technical
Specifications

Date of Issuance: March 6, 1992

ATTACHMENT TO LICENSE AMENDMENT

AMENDMENT NO. 59 TO FACILITY OPERATING LICENSE NO. NPF-41

DOCKET NO. STN 50-528

Replace the following pages of the Appendix A Technical Specifications with the enclosed pages. The revised pages are identified by amendment number and contain vertical lines indicating the areas of change.

Remove

3/4 8-9
3/4 8-10
3/4 8-12
-
B 3/4 8-2

Insert

3/4 8-9
3/4 8-10
3/4 8-12
3/4 8-12a
B 3/4 8-2

ELECTRICAL POWER SYSTEMS

3/4.8.2 D.C. SOURCES

OPERATING

LIMITING CONDITION FOR OPERATION

3.8.2.1 As a minimum the D.C. trains listed in Table 3.8-1 shall be OPERABLE and energized.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTION:

- a. With one of the required D.C. trains inoperable, restore the inoperable D.C. trains to OPERABLE status within 2 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.
- b. With one of the required chargers inoperable, either provide charging capability to the affected channel with the associated backup battery charger, or demonstrate the OPERABILITY of its associated battery bank by performing Surveillance Requirement 4.8.2.1a.1. within 1 hour, and at least once per 8 hours thereafter. If any Category A limit in Table 4.8-2 is not met, declare the battery inoperable.

SURVEILLANCE REQUIREMENTS

4.8.2.1 Each 125-volt battery bank and charger shall be demonstrated OPERABLE:

- a. At least once per 7 days by verifying that:
 1. The parameters in Table 4.8-2 meet the Category A limits, and
 2. The total battery terminal voltage is greater than or equal to 129 volts on float charge (Exide) or 131 volts on float charge (AT&T).

ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

- b. At least once per 92 days and within 7 days after a battery discharge with battery terminal voltage below 105 volts, or battery overcharge with battery terminal voltage above 150 volts, by verifying that:
 - 1. The parameters in Table 4.8-2 meet the Category B limits,
 - 2. There is no visible corrosion at either terminals or connectors, or the connection resistance of these items is less than 150×10^{-6} ohms, and
 - 3. The average electrolyte temperature of six connected cells is above 60°F.
- c. At least once per 18 months by verifying that:
 - 1. The cells, cell plates, and battery racks show no visual indication of physical damage or abnormal deterioration,
 - 2. The cell-to-cell and terminal connections are clean, tight, and coated with anticorrosion material,
 - 3. The resistance of each cell-to-cell and terminal connection is less than or equal to 150×10^{-6} ohms, and
 - 4. The battery charger will supply at least 400 amperes for batteries A and B and 300 amperes for batteries C and D at 125 volts for at least 8 hours.
- d. At least once per 18 months, during shutdown, by verifying that the battery capacity is adequate to supply and maintain in OPERABLE status all of the actual or simulated emergency loads for the design duty cycle when the battery is subjected to a battery service test.
- e. At least once per 60 months, during shutdown, by verifying that the battery capacity is at least 80% (Exide) or 90% (AT&T) of the manufacturer's rating when subjected to a performance discharge test. This performance discharge test may be performed in lieu of the battery service test required by Surveillance Requirement 4.8.2.1d.
- f. Annual performance discharge tests of battery capacity shall be given to any battery that shows signs of degradation or has reached 85% of the service life expected for the application. Degradation is indicated when the battery capacity drops more than 10% (Exide) or 5% (AT&T) of rated capacity from its average on previous performance tests, or is below 90% (Exide) or 95% (AT&T) of the manufacturer's rating.

TABLE 4.8-2 (EXIDE)

BATTERY SURVEILLANCE REQUIREMENTS

Parameter	CATEGORY A ⁽¹⁾		CATEGORY B ⁽²⁾
	Limits for each designated pilot cell	Limits for each connected cell	Allowable ⁽³⁾ value for each connected cell
Electrolyte Level	>Minimum level indication mark, and $\leq \frac{1}{4}$ " above maximum level indication mark	>Minimum level indication mark, and $\leq \frac{1}{4}$ " above maximum level indication mark	Above top of plates, and not overflowing
Float Voltage	≥ 2.13 volts	≥ 2.13 volts(a)	> 2.07 volts
Specific Gravity(b)	≥ 1.200 (c)	≥ 1.195 Average of all connected cells > 1.205	Not more than 0.020 below the average of all connected cells Average of all connected cells ≥ 1.195 (c)

- (1) For any Category A parameter(s) outside the limit(s) shown, the battery may be considered OPERABLE provided that within 24 hours all the Category B measurements are taken and found to be within their allowable values, and provided all Category A and B parameter(s) are restored to within limits within the next 6 days.
- (2) For any Category B parameter(s) outside the limit(s) shown, the battery may be considered OPERABLE provided that the Category B parameters are within their allowable values and provided the Category B parameter(s) are restored to within limits within 7 days.
- (3) Any Category B parameter not within its allowable value, declare the battery inoperable.
 - (a) Corrected for average electrolyte temperature.
 - (b) Corrected for electrolyte temperature and level.
 - (c) Or battery charging current is less than 2 amps when on charge.

TABLE 4.8-2 (AT&T)

BATTERY SURVEILLANCE REQUIREMENTS

Parameter	CATEGORY A ⁽¹⁾		CATEGORY B ⁽²⁾
	Limits for each designated pilot cell	Limits for each connected cell	Allowable ⁽³⁾ value for each connected cell
Electrolyte Level	>Minimum level indication mark, and < 1/4" above maximum level indication mark	>Minimum level indication mark, and < 1/4" above maximum level indication mark	Above top of plates, and not overflowing
Float Voltage	≥ 2.18 volts	≥ 2.18 volts(a)	> 2.14 volts
Specific Gravity(b)		≥ 1.280	Not more than 0.020 below the average of all connected cells
	≥ 1.290(c)	Average of all connected cells ≥ 1.290	Average of all connected cells ≥ 1.280(c)

- (1) For any Category A parameter(s) outside the limit(s) shown, the battery may be considered OPERABLE provided that within 24 hours all the Category B measurements are taken and found to be within their allowable values, and provided all Category A and B parameter(s) are restored to within limits within the next 6 days.
- (2) For any Category B parameter(s) outside the limit(s) shown, the battery may be considered OPERABLE provided that the Category B parameters are within their allowable values and provided the Category B parameter(s) are restored to within limits within 7 days.
- (3) Any Category B parameter not within its allowable value, declare the battery inoperable.
 - (a) Corrected for average electrolyte temperature.
 - (b) Corrected for electrolyte temperature and level.
 - (c) Or battery charging current is less than 2 amps when on charge.

ELECTRICAL POWER SYSTEMS

BASES

A.C. SOURCES, D.C. SOURCES AND ONSITE POWER DISTRIBUTION SYSTEMS (Continued)

The surveillance requirement for demonstrating the OPERABILITY of the Station batteries are based on the recommendations of Regulatory Guide 1.129, "Maintenance Testing and Replacement of Large Lead Storage Batteries for Nuclear Power Plants," February 1978, and IEEE Std 450-1980, "IEEE Recommended Practice for Maintenance, Testing, and Replacement of Large Lead Storage Batteries for Generating Stations and Substations."

Verifying average electrolyte temperature above the minimum for which the battery was sized, total battery terminal voltage on float charge, connection resistance values and the performance of battery service and discharge tests ensures the effectiveness of the charging system, the ability to handle high discharge rates and compares the battery capacity at that time with the rated capacity.

Table 4.8-2 specifies the normal limits for each designated pilot cell and each connected cell for electrolyte level, float voltage and specific gravity. The limits for the designated pilot cells float voltage and specific gravity, greater than 2.13 volts (Exide) 2.18 volts (AT&T) and 0.010 below the manufacturer's full charge specific gravity or a battery charger current that had stabilized at a low value, is characteristic of a charged cell with adequate capacity. The normal limits for each connected cell for float voltage and specific gravity, greater than 2.13 volts (Exide) 2.18 volts (AT&T) and not more than 0.020 below the manufacturer's full charge specific gravity with an average specific gravity of all the connected cells not more than 0.010 below the manufacturer's full charge specific gravity, ensures the OPERABILITY and capability of the battery.

Operation with a battery cell's parameter outside the normal limit but within the allowable value specified in Table 4.8-2 is permitted for up to 7 days. During this 7-day period: (1) the allowable values for electrolyte level ensures no physical damage to the plates with an adequate electron transfer capability; (2) the allowable value for the average specific gravity of all the cells, not more than 0.020 below the manufacturer's recommended full charge specific gravity, ensures that the decrease in rating will be less than the safety margin provided in sizing; (3) the allowable value for an individual cell's specific gravity, ensures that an individual cell's specific gravity will not be more than 0.040 below the manufacturer's full charge specific gravity and that the overall capability of the battery will be maintained within an acceptable limit; and (4) the allowable value for an individual cell's float voltage, greater than 2.07 volts (Exide) 2.14 volts (AT&T), ensures the battery's capability to perform its design function.

If any other metallic structures (e.g., buildings, new or modified piping systems, conduit) are placed in the ground in the vicinity of the fuel oil storage system or if the original system is modified, the adequacy and frequency of inspections of the cathodic protection system shall be re-evaluated and adjusted in accordance with Regulatory Guide 1.137.



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

ARIZONA PUBLIC SERVICE COMPANY, ET AL.

DOCKET NO. STN 50-529

PALO VERDE NUCLEAR GENERATING STATION, UNIT NO. 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 46
License No. NPF-51

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by the Arizona Public Service Company (APS or the licensee) on behalf of itself and the Salt River Project Agricultural Improvement and Power District, El Paso Electric Company, Southern California Edison Company, Public Service Company of New Mexico, Los Angeles Department of Water and Power, and Southern California Public Power Authority dated December 26, 1991, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act) and the Commission's regulations set forth in 10 CFR Part I;
 - B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;
 - C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;
 - D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and
 - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.
2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C(2) of Facility Operating License No. NPF-51 is hereby amended to read as follows:

(2) Technical Specifications and Environmental Protection Plan

The Technical Specifications contained in Appendix A, as revised through Amendment No. 46, and the Environmental Protection Plan contained in Appendix B, are hereby incorporated into this license. APS shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan, except where otherwise stated in specific license conditions.

3. This license amendment is effective as of the date of issuance and must be fully implemented no later than 45 days from the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION



Theodore R. Quay, Director
Project Directorate V
Division of Reactor Projects III/IV/V
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Technical
Specifications

Date of Issuance: March 6, 1992

ATTACHMENT TO LICENSE AMENDMENT

AMENDMENT NO. 46 TO FACILITY OPERATING LICENSE NO. NPF-51

DOCKET NO. STN 50-529

Replace the following pages of the Appendix A Technical Specifications with the enclosed pages. The revised pages are identified by amendment number and contain vertical lines indicating the areas of change.

Remove

3/4 8-9
3/4 8-10
3/4 8-12
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B 3/4 8-2

Insert

3/4 8-9
3/4 8-10
3/4 8-12
3/4 8-12a
B 3/4 8-2

ELECTRICAL POWER SYSTEMS

3/4.8.2 D.C. SOURCES

OPERATING

LIMITING CONDITION FOR OPERATION

3.8.2.1 As a minimum the D.C. trains listed in Table 3.8-1 shall be OPERABLE and energized.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTION:

- a. With one of the required D.C. trains inoperable, restore the inoperable D.C. trains to OPERABLE status within 2 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.
- b. With one of the required chargers inoperable, either provide charging capability to the affected channel with the associated backup battery charger, or demonstrate the OPERABILITY of its associated battery bank by performing Surveillance Requirement 4.8.2.1a.1. within 1 hour, and at least once per 8 hours thereafter. If any Category A limit in Table 4.8-2 is not met, declare the battery inoperable.

SURVEILLANCE REQUIREMENTS

4.8.2.1 Each 125-volt battery bank and charger shall be demonstrated OPERABLE:

- a. At least once per 7 days by verifying that:
 1. The parameters in Table 4.8-2 meet the Category A limits, and
 2. The total battery terminal voltage is greater than or equal to 129 volts on float charge (Exide) or 131 volts on float charge (AT&T)

ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

- b. At least once per 92 days and within 7 days after a battery discharge with battery terminal voltage below 105 volts, or battery overcharge with battery terminal voltage above 150 volts, by verifying that:
 - 1. The parameters in Table 4.8-2 meet the Category B limits,
 - 2. There is no visible corrosion at either terminals or connectors, or the connection resistance of these items is less than 150×10^{-6} ohms, and
 - 3. The average electrolyte temperature of six connected cells is above 60°F.
- c. At least once per 18 months by verifying that:
 - 1. The cells, cell plates, and battery racks show no visual indication of physical damage or abnormal deterioration,
 - 2. The cell-to-cell and terminal connections are clean, tight, and coated with anticorrosion material,
 - 3. The resistance of each cell-to-cell and terminal connection is less than or equal to 150×10^{-6} ohms, and
 - 4. The battery charger will supply at least 400 amperes for batteries A and B and 300 amperes for batteries C and D at 125 volts for at least 8 hours.
- d. At least once per 18 months, during shutdown, by verifying that the battery capacity is adequate to supply and maintain in OPERABLE status all of the actual or simulated emergency loads for the design duty cycle when the battery is subjected to a battery service test.
- e. At least once per 60 months, during shutdown, by verifying that the battery capacity is at least 80% (Exide) or 90% (AT&T) of the manufacturer's rating when subjected to a performance discharge test. This performance discharge test may be performed in lieu of the battery service test required by Surveillance Requirement 4.8.2.1d.
- f. Annual performance discharge tests of battery capacity shall be given to any battery that shows signs of degradation or has reached 85% of the service life expected for the application. Degradation is indicated when the battery capacity drops more than 10% (Exide) or 5% (AT&T) of rated capacity from its average on previous performance tests, or is below 90% (Exide) or 95% (AT&T) of the manufacturer's rating.

TABLE 4.8-2 (EXIDE)

BATTERY SURVEILLANCE REQUIREMENTS

Parameter	CATEGORY A ⁽¹⁾		CATEGORY B ⁽²⁾
	Limits for each designated pilot cell	Limits for each connected cell	Allowable ⁽³⁾ value for each connected cell
Electrolyte Level	>Minimum level indication mark, and $\leq \frac{1}{4}$ " above maximum level indication mark	>Minimum level indication mark, and $\leq \frac{1}{4}$ " above maximum level indication mark	Above top of plates, and not overflowing
Float Voltage	≥ 2.13 volts	≥ 2.13 volts(a)	> 2.07 volts
Specific Gravity(b)	≥ 1.200 (c)	≥ 1.195 Average of all connected cells > 1.205	Not more than 0.020 below the average of all connected cells Average of all connected cells ≥ 1.195 (c)

- (1) For any Category A parameter(s) outside the limit(s) shown, the battery may be considered OPERABLE provided that within 24 hours all the Category B measurements are taken and found to be within their allowable values, and provided all Category A and B parameter(s) are restored to within limits within the next 6 days.
- (2) For any Category B parameter(s) outside the limit(s) shown, the battery may be considered OPERABLE provided that the Category B parameters are within their allowable values and provided the Category B parameter(s) are restored to within limits within 7 days.
- (3) Any Category B parameter not within its allowable value, declare the battery inoperable.
 - (a) Corrected for average electrolyte temperature.
 - (b) Corrected for electrolyte temperature and level.
 - (c) Or battery charging current is less than 2 amps when on charge.

TABLE 4.8-2 (AT&T)

BATTERY SURVEILLANCE REQUIREMENTS

Parameter	CATEGORY A ⁽¹⁾		CATEGORY B ⁽²⁾
	Limits for each designated pilot cell	Limits for each connected cell	Allowable ⁽³⁾ value for each connected cell
Electrolyte Level	>Minimum level indication mark, and $\leq \frac{1}{8}$ " above maximum level indication mark	>Minimum level indication mark, and $\leq \frac{1}{8}$ " above maximum level indication mark	Above top of plates, and not overflowing
Float Voltage	≥ 2.18 volts	≥ 2.18 volts(a)	> 2.14 volts
Specific Gravity(b)		≥ 1.280	Not more than 0.020 below the average of all connected cells
	$\geq 1.290(c)$	Average of all connected cells > 1.290	Average of all connected cells $\geq 1.280(c)$

- (1) For any Category A parameter(s) outside the limit(s) shown, the battery may be considered OPERABLE provided that within 24 hours all the Category B measurements are taken and found to be within their allowable values, and provided all Category A and B parameter(s) are restored to within limits within the next 6 days.
- (2) For any Category B parameter(s) outside the limit(s) shown, the battery may be considered OPERABLE provided that the Category B parameters are within their allowable values and provided the Category B parameter(s) are restored to within limits within 7 days.
- (3) Any Category B parameter not within its allowable value, declare the battery inoperable.
 - (a) Corrected for average electrolyte temperature.
 - (b) Corrected for electrolyte temperature and level.
 - (c) Or battery charging current is less than 2 amps when on charge.

ELECTRICAL POWER SYSTEMS

BASES

A.C. SOURCES, D.C. SOURCES AND ONSITE POWER DISTRIBUTION SYSTEMS (Continued)

The surveillance requirement for demonstrating the OPERABILITY of the Station batteries are based on the recommendations of Regulatory Guide 1.129, "Maintenance Testing and Replacement of Large Lead Storage Batteries for Nuclear Power Plants," February 1978, and IEEE Std 450-1980, "IEEE Recommended Practice for Maintenance, Testing, and Replacement of Large Lead Storage Batteries for Generating Stations and Substations."

Verifying average electrolyte temperature above the minimum for which the battery was sized, total battery terminal voltage on float charge, connection resistance values and the performance of battery service and discharge tests ensures the effectiveness of the charging system, the ability to handle high discharge rates and compares the battery capacity at that time with the rated capacity.

Table 4.8-2 specifies the normal limits for each designated pilot cell and each connected cell for electrolyte level, float voltage and specific gravity. The limits for the designated pilot cells float voltage and specific gravity, greater than 2.13 volts (Exide) 2.18 volts (AT&T) and 0.010 below the manufacturer's full charge specific gravity or a battery charger current that had stabilized at a low value, is characteristic of a charged cell with adequate capacity. The normal limits for each connected cell for float voltage and specific gravity, greater than 2.13 volts (Exide) 2.18 volts (AT&T) and not more than 0.020 below the manufacturer's full charge specific gravity with an average specific gravity of all the connected cells not more than 0.010 below the manufacturer's full charge specific gravity, ensures the OPERABILITY and capability of the battery.

Operation with a battery cell's parameter outside the normal limit but within the allowable value specified in Table 4.8-2 is permitted for up to 7 days. During this 7-day period: (1) the allowable values for electrolyte level ensures no physical damage to the plates with an adequate electron transfer capability; (2) the allowable value for the average specific gravity of all the cells, not more than 0.020 below the manufacturer's recommended full charge specific gravity, ensures that the decrease in rating will be less than the safety margin provided in sizing; (3) the allowable value for an individual cell's specific gravity, ensures that an individual cell's specific gravity will not be more than 0.040 below the manufacturer's full charge specific gravity and that the overall capability of the battery will be maintained within an acceptable limit; and (4) the allowable value for an individual cell's float voltage, greater than 2.07 volts (Exide) 2.14 volts (AT&T), ensures the battery's capability to perform its design function.

If any other metallic structures (e.g., buildings, new or modified piping systems, conduit) are placed in the ground in the vicinity of the fuel oil storage system or if the original system is modified, the adequacy and frequency of inspections of the cathodic protection system shall be re-evaluated and adjusted in accordance with Regulatory Guide 1.137.



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

ARIZONA PUBLIC SERVICE COMPANY, ET AL.

DOCKET NO. STN 50-530

PALO VERDE NUCLEAR GENERATING STATION, UNIT NO. 3

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 32
License No. NPF-74

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by the Arizona Public Service Company (APS or the licensee) on behalf of itself and the Salt River Project Agricultural Improvement and Power District, El Paso Electric Company, Southern California Edison Company, Public Service Company of New Mexico, Los Angeles Department of Water and Power, and Southern California Public Power Authority dated December 26, 1991, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act) and the Commission's regulations set forth in 10 CFR Chapter I;
 - B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;
 - C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;
 - D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and
 - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.
2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C(2) of Facility Operating License No. NPF-74 is hereby amended to read as follows:

(2) Technical Specifications and Environmental Protection Plan

The Technical Specifications contained in Appendix A, as revised through Amendment No. 32, and the Environmental Protection Plan contained in Appendix B, are hereby incorporated into this license. APS shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan, except where otherwise stated in specific license conditions.

3. This license amendment is effective as of the date of issuance and must be fully implemented no later than 45 days from the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION



Theodore R. Quay, Director
Project Directorate V
Division of Reactor Projects III/IV/V
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Technical
Specifications

Date of Issuance: March 6, 1992

ATTACHMENT TO LICENSE AMENDMENT

AMENDMENT NO. 32 TO FACILITY OPERATING LICENSE NO. NPF-74

DOCKET NO. STN 50-530

Replace the following pages of the Appendix A Technical Specifications with the enclosed pages. The revised pages are identified by amendment number and contain vertical lines indicating the areas of change.

Remove

3/4 8-9
3/4 8-10
3/4 8-12
-
B 3/4 8-2

Insert

3/4 8-9
3/4 8-10
3/4 8-12
3/4 8-12a
B 3/4 8-2

ELECTRICAL POWER SYSTEMS

3/4.8.2 D.C. SOURCES

OPERATING

LIMITING CONDITION FOR OPERATION

3.8.2.1 As a minimum the D.C. trains listed in Table 3.8-1 shall be OPERABLE and energized.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTION:

- a. With one of the required D.C. trains inoperable, restore the inoperable D.C. trains to OPERABLE status within 2 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.
- b. With one of the required chargers inoperable, either provide charging capability to the affected channel with the associated backup battery charger, or demonstrate the OPERABILITY of its associated battery bank by performing Surveillance Requirement 4.8.2.1a.1. within 1 hour, and at least once per 8 hours thereafter. If any Category A limit in Table 4.8-2 is not met, declare the battery inoperable.

SURVEILLANCE REQUIREMENTS

4.8.2.1 Each 125-volt battery bank and charger shall be demonstrated OPERABLE:

- a. At least once per 7 days by verifying that:
 1. The parameters in Table 4.8-2 meet the Category A limits, and
 2. The total battery terminal voltage is greater than or equal to 129 volts on float charge (Exide) or 131 volts on float charge (AT&T)

ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

- b. At least once per 92 days and within 7 days after a battery discharge with battery terminal voltage below 105 volts, or battery overcharge with battery terminal voltage above 150 volts, by verifying that:
1. The parameters in Table 4.8-2 meet the Category B limits,
 2. There is no visible corrosion at either terminals or connectors, or the connection resistance of these items is less than 150×10^{-6} ohms, and
 3. The average electrolyte temperature of six connected cells is above 60°F.
- c. At least once per 18 months by verifying that:
1. The cells, cell plates, and battery racks show no visual indication of physical damage or abnormal deterioration,
 2. The cell-to-cell and terminal connections are clean, tight, and coated with anticorrosion material,
 3. The resistance of each cell-to-cell and terminal connection is less than or equal to 150×10^{-6} ohms, and
 4. The battery charger will supply at least 400 amperes for batteries A and B and 300 amperes for batteries C and D at 125 volts for at least 8 hours.
- d. At least once per 18 months,* during shutdown, by verifying that the battery capacity is adequate to supply and maintain in OPERABLE status all of the actual or simulated emergency loads for the design duty cycle when the battery is subjected to a battery service test.
- e. At least once per 60 months, during shutdown, by verifying that the battery capacity is at least 80% (Exide) or 90% (AT&T) of the manufacturer's rating when subjected to a performance discharge test. This performance discharge test may be performed in lieu of the battery service test required by Surveillance Requirement 4.8.2.1d.
- f. Annual performance discharge tests of battery capacity shall be given to any battery that shows signs of degradation or has reached 85% of the service life expected for the application. Degradation is indicated when the battery capacity drops more than 10% (Exide) or 5% (AT&T) of rated capacity from its average on previous performance tests, or is below 90% (Exide) or 95% (AT&T) of the manufacturer's rating.

*This surveillance requirement, otherwise due March 1, 1991, will be performed prior to the end of the second refueling outage or by June 15, 1991.

TABLE 4.8-2 (EXIDE)

BATTERY SURVEILLANCE REQUIREMENTS

Parameter	CATEGORY A ⁽¹⁾		CATEGORY B ⁽²⁾
	Limits for each designated pilot cell	Limits for each connected cell	Allowable ⁽³⁾ value for each connected cell
Electrolyte Level	>Minimum level indication mark, and $\leq \frac{1}{4}$ " above maximum level indication mark	>Minimum level indication mark, and $\leq \frac{1}{4}$ " above maximum level indication mark	Above top of plates, and not overflowing
Float Voltage	≥ 2.13 volts	≥ 2.13 volts(a)	> 2.07 volts
Specific Gravity(b)		≥ 1.195	Not more than 0.020 below the average of all connected cells
	≥ 1.200 (c)	Average of all connected cells ≥ 1.205	Average of all connected cells ≥ 1.195 (c)

- (1) For any Category A parameter(s) outside the limit(s) shown, the battery may be considered OPERABLE provided that within 24 hours all the Category B measurements are taken and found to be within their allowable values, and provided all Category A and B parameter(s) are restored to within limits within the next 6 days.
- (2) For any Category B parameter(s) outside the limit(s) shown, the battery may be considered OPERABLE provided that the Category B parameters are within their allowable values and provided the Category B parameter(s) are restored to within limits within 7 days.
- (3) Any Category B parameter not within its allowable value, declare the battery inoperable.
 - (a) Corrected for average electrolyte temperature.
 - (b) Corrected for electrolyte temperature and level.
 - (c) Or battery charging current is less than 2 amps when on charge.

TABLE 4.8-2 (AT&T)

BATTERY SURVEILLANCE REQUIREMENTS

Parameter	CATEGORY A ⁽¹⁾		CATEGORY B ⁽²⁾
	Limits for each designated pilot cell	Limits for each connected cell	Allowable ⁽³⁾ value for each connected cell
Electrolyte Level	>Minimum level indication mark, and < 1/4" above maximum level indication mark	>Minimum level indication mark, and < 1/4" above maximum level indication mark	Above top of plates, and not overflowing
Float Voltage	≥ 2.18 volts	≥ 2.18 volts(a)	> 2.14 volts
Specific Gravity(b)		≥ 1.280	Not more than 0.020 below the average of all connected cells
	≥ 1.290(c)	Average of all connected cells ≥ 1.290	Average of all connected cells ≥ 1.280(c)

- (1) For any Category A parameter(s) outside the limit(s) shown, the battery may be considered OPERABLE provided that within 24 hours all the Category B measurements are taken and found to be within their allowable values, and provided all Category A and B parameter(s) are restored to within limits within the next 6 days.
- (2) For any Category B parameter(s) outside the limit(s) shown, the battery may be considered OPERABLE provided that the Category B parameters are within their allowable values and provided the Category B parameter(s) are restored to within limits within 7 days.
- (3) Any Category B parameter not within its allowable value, declare the battery inoperable.
 - (a) Corrected for average electrolyte temperature.
 - (b) Corrected for electrolyte temperature and level.
 - (c) Or battery charging current is less than 2 amps when on charge.

ELECTRICAL POWER SYSTEMS

BASES

A.C. SOURCES, D.C. SOURCES AND ONSITE POWER DISTRIBUTION SYSTEMS (Continued)

The surveillance requirement for demonstrating the OPERABILITY of the Station batteries are based on the recommendations of Regulatory Guide 1.129, "Maintenance Testing and Replacement of Large Lead Storage Batteries for Nuclear Power Plants," February 1978, and IEEE Std 450-1980, "IEEE Recommended Practice for Maintenance, Testing, and Replacement of Large Lead Storage Batteries for Generating Stations and Substations."

Verifying average electrolyte temperature above the minimum for which the battery was sized, total battery terminal voltage on float charge, connection resistance values and the performance of battery service and discharge tests ensures the effectiveness of the charging system, the ability to handle high discharge rates and compares the battery capacity at that time with the rated capacity.

Table 4.8-2 specifies the normal limits for each designated pilot cell and each connected cell for electrolyte level, float voltage and specific gravity. The limits for the designated pilot cells float voltage and specific gravity, greater than 2.13 volts (Exide) 2.18 volts (AT&T) and 0.010 below the manufacturer's full charge specific gravity or a battery charger current that had stabilized at a low value, is characteristic of a charged cell with adequate capacity. The normal limits for each connected cell for float voltage and specific gravity, greater than 2.13 volts (Exide) 2.18 volts (AT&T) and not more than 0.020 below the manufacturer's full charge specific gravity with an average specific gravity of all the connected cells not more than 0.010 below the manufacturer's full charge specific gravity, ensures the OPERABILITY and capability of the battery.

Operation with a battery cell's parameter outside the normal limit but within the allowable value specified in Table 4.8-2 is permitted for up to 7 days. During this 7-day period: (1) the allowable values for electrolyte level ensures no physical damage to the plates with an adequate electron transfer capability; (2) the allowable value for the average specific gravity of all the cells, not more than 0.020 below the manufacturer's recommended full charge specific gravity, ensures that the decrease in rating will be less than the safety margin provided in sizing; (3) the allowable value for an individual cell's specific gravity, ensures that an individual cell's specific gravity will not be more than 0.040 below the manufacturer's full charge specific gravity and that the overall capability of the battery will be maintained within an acceptable limit; and (4) the allowable value for an individual cell's float voltage, greater than 2.07 volts (Exide) 2.14 volts (AT&T), ensures the battery's capability to perform its design function.

If any other metallic structures (e.g., buildings, new or modified piping systems, conduit) are placed in the ground in the vicinity of the fuel oil storage system or if the original system is modified, the adequacy and frequency of inspections of the cathodic protection system shall be re-evaluated and adjusted in accordance with Regulatory Guide 1.137.



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NO. 59 TO FACILITY OPERATING LICENSE NO. NPF-41,
AMENDMENT NO. 46 TO FACILITY OPERATING LICENSE NO. NPF-51,
AND AMENDMENT NO. 32 TO FACILITY OPERATING LICENSE NO. NPF-74
ARIZONA PUBLIC SERVICE COMPANY, ET AL.
PALO VERDE NUCLEAR GENERATING STATION, UNIT NOS. 1, 2, AND 3
DOCKET NOS. STN 50-528, STN 50-529, AND STN 50-530

1.0 INTRODUCTION

By letter dated December 26, 1991, the Arizona Public Service Company (APS or the licensee) submitted a request for changes to the Technical Specifications (TS) for the Palo Verde Nuclear Generating Station, Units 1, 2, and 3 (Appendix A to Facility Operating License Nos. NPF-41, NPF-51, and NPF-74, respectively). The Arizona Public Service Company submitted this request on behalf of itself, the Salt River Project Agricultural Improvement and Power District, Southern California Edison Company, El Paso Electric Company, Public Service Company of New Mexico, Los Angeles Department of Water and Power, and Southern California Public Power Authority. The proposed changes would revise the technical specifications to allow replacement of the existing 125V dc batteries with new batteries.

2.0 DISCUSSION

Two predominant problems developed with the existing Exide Corporation batteries after installation. First, the seal between the cover and the terminal posts was not entirely effective. When the electrolyte enters the positive post seal area and becomes trapped, corrosion of the post takes place. The corrosion builds up over time, and when the growth exerts enough pressure on the seal area, the plastic nut around the seal or the cell cover, or both, crack to relieve the pressure. The second problem was copper contamination. The battery posts are constructed of copper cast in lead. When there is a defect in the lead post casting that allows the electrolyte to penetrate the lead and contact the copper, electroplating occurs, removing copper from the copper insert in the position post and depositing it on the negative plates. Based on experience and guidance from Exide Corporation, Arizona Public Service Company (APS) concluded that both the cover cracks and copper contamination were indicative of the problems that could cause service degradation of the batteries. By letter dated December 26, 1991, the licensee proposed an amendment which would allow replacement of the existing Exide 125V dc batteries with AT&T batteries.

3.0 EVALUATION

The licensee has proposed to modify Technical Specifications 3/4 8.2, DC Sources, Table 4.8-2, by splitting it into two sections, one for the existing (Exide) batteries and another for the replacement (AT&T) batteries. The split-table configuration will be maintained until both Trains A and B batteries are replaced.

The licensee has selected AT&T LINEAGE 2000 Round Cell Battery Model KS-20472 as the replacement battery. The battery will be installed on AT&T LINEAGE 2000 battery stand made of polyester glass and metal, reinforced to ensure seismic qualification.

The licensee has also proposed to amend Surveillance Requirement 4.8.2.1.b to consider overcharge voltage as "above 150V" instead of "above 145V" which is consistent with the manufacturer's suggested method of applying boost and equalizing charge and is, therefore, acceptable.

The licensee has also proposed to amend Surveillance Requirement 4.8.2.1.e and 4.8.2.1.f based on the IEEE-450 replacement criteria of 80% of manufacturer's rating; therefore, the battery's rated capacity should be at least 125% (1.25 aging factor) of the load expected at the end of its service life. The new replacement batteries are designed such that their capacity actually improves with age. The proposed surveillance requirement for AT&T batteries in 4.8.2.1.e is to verify that the battery capacity is at least 90% of the manufacturer's rating when subjected to a performance discharge test, and the proposed surveillance requirement in 4.8.2.1.f is that degradation is indicated when the battery capacity drops more than 5% of rated capacity. These surveillance requirements improve the current battery sizing design margin between load and battery rated capacity. They are conservative and are, therefore, acceptable.

The proposed Technical Specification would allow replacement of the existing 125V dc batteries with new batteries during each unit's refueling outage. Technical Specification 3.8.2.2 states that "As a minimum, one dc train shall be operable and energized." The battery replacement will be conducted with one dc train available, as required. We find this to be acceptable.

Because of their continuing problems, the existing Exide batteries are approaching the end of their useful life; therefore, it will be prudent to replace them with the new AT&T batteries. The replacement batteries are being purchased to meet the same requirements as the installed batteries and the performance of plant safety functions will not be degraded by the new batteries. The AT&T cell does not lose capacity with age, and therefore, it should last for the life of the plant.

4.0 SUMMARY

The licensee has proposed a revision to Technical Specification Section 3/4 8.2 which would allow replacement of the existing 125 V dc batteries with new batteries during each unit's refueling outage. The staff has reviewed the licensee's submittal and has concluded that Palo Verde Station can be operated safely with new batteries and there is reasonable assurance that adequate dc power will be available to mitigate any credible event that can occur during and after the replacement of batteries and, therefore, the proposed Technical Specification change is acceptable.

5.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Arizona State official was notified of the proposed issuance of the amendment. The State official had no comments.

6.0 ENVIRONMENTAL CONSIDERATION

The amendments change a requirement with respect to the installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 and changes surveillance requirements. The NRC staff has determined that the amendments involve no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendments involve no significant hazards consideration, and there has been no public comment on such finding (57 FR 2586). Accordingly, the amendments meet the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendments.

7.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above, that (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributor: N. K. Trehan

Date: March 6, 1992