

May 25, 2006

Mr. James M. Levine
Executive Vice President, Generation
Arizona Public Service Company
P. O. Box 52034
Phoenix, AZ 85072-2034

SUBJECT: PALO VERDE NUCLEAR GENERATING STATION, UNITS 1, 2, AND 3 -
ISSUANCE OF AMENDMENTS RE: EMERGENCY DIESEL GENERATOR
COOLING WATER SYSTEMS MODIFICATIONS (TAC. NOS. MC7288, MC7289
AND MC7290)

Dear Mr. Levine:

The Commission has issued the enclosed Amendment No. 160 to Facility Operating License No. NPF-41, Amendment No. 160 to Facility Operating License No. NPF-51, and Amendment No. 160 to Facility Operating License No. NPF-74 for the Palo Verde Nuclear Generating Station (Palo Verde), Units 1, 2, and 3, respectively. Amendment No. 159, issued on April 6, 2006, was applicable only to Palo Verde, Unit 1. Consistent with the request made by Arizona Public Service Company in its December 16, 1999, letter, Amendment No. 159 is being skipped in the Palo Verde, Units 2 and 3, Facility Operating Licenses so that the same amendment number would apply to all three units. The amendments authorize revisions to the Updated Final Safety Analysis Report (UFSAR) in response to your application dated June 3, 2005, as supplemented by letter dated March 7, 2006.

The approved changes to the UFSAR are associated with plant modifications made to the diesel generator cooling water system for each emergency diesel generator for the three units. A copy of the related Safety Evaluation is also enclosed. The Notice of Issuance will be included in the Commission's next biweekly *Federal Register* notice.

Sincerely,

/RA/

Mel B. Fields, Senior Project Manager
Plant Licensing Branch IV
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

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

Enclosures: 1. Amendment No. 160 to NPF-41
2. Amendment No. 160 to NPF-51
3. Amendment No. 160 to NPF-74
4. Safety Evaluation

cc w/encls: See next page

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DATE	5/23/06	5/25/06	3/31/06	5/22/06	5/25/06

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ARIZONA PUBLIC SERVICE COMPANY, ET AL.

DOCKET NO. STN 50-528

PALO VERDE NUCLEAR GENERATING STATION, UNIT 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 160
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 June 3, 2005, as supplemented by letter dated March 7, 2006, 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, by Amendment No. 160, the license is amended to authorize revision of the Updated Final Safety Analysis Report (UFSAR), as set forth in the application for amendment by APS dated June 3, 2005, as supplemented by letter dated March 7, 2006. APS shall update the UFSAR to incorporate the description of the approved

changes associated with the plant modifications made to the diesel generator cooling water system for each emergency diesel generator as described in the amendment application of June 3, 2005, as supplemented by letter dated March 7, 2006, and the NRC staff's safety evaluation enclosed to this amendment, and shall submit the revised description authorized by this amendment with the next update of the UFSAR.

3. This license amendment is effective as of the date of issuance and shall be implemented within 90 days of the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

David Terao, Branch Chief
Plant Licensing Branch IV
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Date of Issuance: May 25, 2006

ARIZONA PUBLIC SERVICE COMPANY, ET AL.

DOCKET NO. STN 50-529

PALO VERDE NUCLEAR GENERATING STATION, UNIT 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 160
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 June 3, 2005, as supplemented by letter dated March 7, 2006, 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, by Amendment No. 160, the license is amended to authorize revision of the Updated Final Safety Analysis Report (UFSAR), as set forth in the application for amendment by APS dated June 3, 2005, as supplemented by letter dated March 7, 2006. APS shall update the UFSAR to incorporate the description of the approved

changes associated with the plant modifications made to the diesel generator cooling water system for each emergency diesel generator as described in the amendment application of June 3, 2005, as supplemented by letter dated March 7, 2006, and the NRC staff's safety evaluation enclosed to this amendment, and shall submit the revised description authorized by this amendment with the next update of the UFSAR.

3. This license amendment is effective as of the date of issuance and shall be implemented within 90 days of the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

David Terao, Branch Chief
Plant Licensing Branch IV
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Date of Issuance: May 25, 2006

ARIZONA PUBLIC SERVICE COMPANY, ET AL.

DOCKET NO. STN 50-530

PALO VERDE NUCLEAR GENERATING STATION, UNIT 3

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 160
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 June 3, 2005, as supplemented by letter dated March 7, 2006, 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, by Amendment No. 160, the license is amended to authorize revision of the Updated Final Safety Analysis Report (UFSAR), as set forth in the application for amendment by APS dated June 3, 2005, as supplemented by letter dated March 7, 2006. APS shall update the UFSAR to incorporate the description of the approved

changes associated with the plant modifications made to the diesel generator cooling water system for each emergency diesel generator as described in the amendment application of June 3, 2005, as supplemented by letter dated March 7, 2006, and the NRC staff's safety evaluation enclosed to this amendment, and shall submit the revised description authorized by this amendment with the next update of the UFSAR.

3. This license amendment is effective as of the date of issuance and shall be implemented within 90 days of the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

David Terao, Branch Chief
Plant Licensing Branch IV
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Date of Issuance: May 25, 2006

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NO. 160 TO FACILITY OPERATING LICENSE NO. NPF-41,
AMENDMENT NO. 160 TO FACILITY OPERATING LICENSE NO. NPF-51,
AND AMENDMENT NO. 160 TO FACILITY OPERATING LICENSE NO. NPF-74
ARIZONA PUBLIC SERVICE COMPANY, ET AL.
PALO VERDE NUCLEAR GENERATING STATION, UNITS 1, 2, AND 3
DOCKET NOS. STN 50-528, STN 50-529, AND STN 50-530

1.0 INTRODUCTION

By application dated June 3, 2005 (Agencywide Documents Access and Management System Accession No. ML051660189), as supplemented by letter dated March 7, 2006 (ML060790148), Arizona Public Service Company (the licensee) requested changes to the Updated Final Safety Analysis Report (UFSAR) for Palo Verde Nuclear Generating Station (Palo Verde), Units 1, 2, and 3. The March 7, 2006, supplement provided additional information that clarified the application, did not expand the scope of the application as originally noticed, and did not change the NRC staff's original proposed no significant hazards consideration determination as published in the *Federal Register* on July 5, 2005 (70 FR 38715).

The requested changes to the UFSAR are associated with plant modifications made to the diesel generator cooling water system (DGCWS) for each emergency diesel generator (EDG) for the three units.

2.0 BACKGROUND

The licensee made plant modifications to the DGCWS for each EDG for the three Palo Verde units. These modifications were implemented during the 1993 and 1999 time period. The first modification, made in the 1993 time period, abandoned the use of the automatic solenoid fill valve (due to leakage problems) and implemented the use of an existing manual bypass valve for filling or providing makeup water to the DGCWS. The capacity of the manual bypass valve was lower than that of the automatic solenoid fill valve. In 1999 another modification was made. The previously-abandoned automatic solenoid fill valve and its associated circuitry and level switch/low-low level alarm were removed. A new manual valve with the same valve capacity of the previous automatic fill valve was installed to replace the existing manual bypass valve at the DGCWS.

The licensee had evaluated these modifications in accordance with Title 10 of the *Code of Federal Regulations* (10 CFR), Section 50.59. The licensee at that time determined that the modifications did not introduce more than a minimal increase in the likelihood of a malfunction

of a system or component important to safety and could, therefore, be implemented without prior NRC approval. Subsequently, these modifications were made.

During an NRC inspection performed at the Palo Verde site in May 2004, the inspection team was concerned that the likelihood of a malfunction resulting from the modifications would increase more than minimally. Therefore, the inspection team characterized this issue as an unresolved item¹ related to compliance with 10 CFR 50.59 requirements. Consequently, the licensee determined that prior NRC approval was required for the implementation of these modifications to the DGCWS. By letter dated June 3, 2005, the licensee requested an amendment to the UFSAR, seeking NRC approval for the above-cited plant modifications made to the DGCWS for each Palo Verde EDG.

3.0 REGULATORY EVALUATION

The DGCWS for each EDG removes waste heat from the diesel generator engine and then transfers this heat to the essential spray pond system through the jacket water heat exchanger and maintains the EDG in a warmed condition during normal standby status.

General Design Criterion (GDC) 17 and GDC 44, as related to the capability of the cooling water system to meet independence and redundancy criteria, assure:

- the capability to transfer heat from DGCWS and components to a heat sink under transient or accident conditions.
- redundancy of components so that, under accident conditions, the safety function can be performed assuming a single active component failure.
- the capability to isolate components of the DGCWS or piping, if required to maintain the system safety function.

Regulatory Guide (RG) 1.9, "Selection, Design, Qualification, and Testing of Emergency Diesel Generator Units Used as Class 1E Onsite Electric Power Systems at Nuclear Power Plants," Revision 3, as related to the design of the diesel engine cooling water system, provides guidance to meet the requirements of these regulations.

The NRC staff utilized these GDCs and RG 1.9 to evaluate the above-cited proposed modifications made to the DGCWS for each Palo Verde EDG.

4.0 TECHNICAL EVALUATION

There are two EDGs for each Palo Verde unit. Each EDG has its own independent DGCWS. The DGCWS is a closed loop cooling water system consisting of a combustion air cooler, an engine-driven cooling water pump, a water-cooled jacket water heat exchanger, a surge tank

¹ Palo Verde Nuclear Generation Station - NRC Problem Identification and Resolution Inspection Report 05000528/2004006, 05000529/2004006, and 05000530/2004006, dated August 16, 2004.

(jacket water stand pipe), valves, instrumentation, and controls. The diesel engine turbocharger is also cooled by the DGCWS. A small motor-driven recirculation jacket water pump, a heater, and a thermostat are included in the system to maintain the jacket water in a warm standby condition. Cooling water from the essential spray pond system is used as the coolant to remove waste heat from the jacket water heat exchanger.

The DGCWS surge tank is an atmospheric vessel designed to accommodate coolant expansion due to temperature changes and minor leaks during EDG operations and to provide net positive suction head to the coolant pump. The surge tank has a capacity of approximately 258 gallons, which provides a sufficient water inventory to support 25 hours of EDG operation during an emergency event without any makeup to the DGCWS. Originally, the surge tank was equipped with a local gauge glass, a low level alarm/switch, an automatic solenoid level control fill valve, and a manual bypass valve. Makeup from the demineralized water system was initiated via the automatic solenoid level control fill valve. As indicated above, plant modifications were made to the DGCWS for each EDG during the 1993 and 1999 time period due to leakage problems associated with the automatic solenoid fill valve. These modifications to the DGCWS would allow the filling or makeup for the system to be performed by operator monitoring and manual filling of the surge tank.

The license performed an evaluation in which no operator action is credited to establish an administratively-allowed DGCWS leakage rate of 1.6 gallons per hour. The licensee states that this administratively-allowed DGCWS leakage provides a measure of confidence that the surge tank will have an adequate water inventory to support 25 hours of EDG operation under all load conditions. The licensee further states that procedures are in place to instruct the operators to monitor (e.g. record the level along with many other EDG parameters) the surge tank water level every 12 hours when the EDG is in a standby condition, thirty minutes after initial loading, and every two hours during loaded operation. These procedures also instruct the operators to refill the surge tank, if needed.

The NRC staff concludes that, with these measures in place, the DGCWS will adequately perform its intended safety function and that the modifications implemented during the 1993 and 1999 time period comply with the relevant regulatory requirements.

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 requirements with respect to installation or use of facility components located within the restricted area as defined in 10 CFR Part 20 and 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 published July 5, 2005 (70 FR 38715). The amendments also relate to changes in recordkeeping, reporting, or administrative procedures or requirements. Accordingly, the

amendments meet the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9) and 10 CFR 51.22(c)(10). 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 amendments will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributor: D. Shum

Date: May 25, 2006

Palo Verde Generating Station,
Units 1, 2, and 3

cc:

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March 2006

Palo Verde Generating Station,
Units 1, 2, and 3

cc:

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March 2006