



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
REGION IV  
1600 EAST LAMAR BOULEVARD  
ARLINGTON, TEXAS 76011-4511

March 16, 2018

Mr. Robert S. Bement  
Executive Vice President Nuclear/  
Chief Nuclear Officer  
Arizona Public Service Company  
P.O. Box 52034, MS 7602  
Phoenix, AZ 85072-2034

SUBJECT: PALO VERDE NUCLEAR GENERATING STATION, UNITS 1, 2, AND 3 - NRC  
TRIENNIAL FIRE PROTECTION BASELINE INSPECTION REPORT (NRC  
INSPECTION REPORT 05000528/2018012; 05000529/2018012;  
05000530/2018012)

Dear Mr. Bement:

On February 15, 2018, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at the Palo Verde Nuclear Generating Station, Units 1, 2, and 3 and discussed the results of this inspection with Ms. Maria Lacal, Senior Vice-President Regulatory and Oversight, and other members of your staff. The results of this inspection are documented in the enclosed report.

The NRC team documented one finding of very low safety significance (Green) in this report. This finding did not involve a violation of NRC requirements.

If you disagree with the finding not associated with a regulatory requirement in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region IV; and the NRC resident inspector at the Palo Verde Nuclear Generating Station.

R. Bement

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This letter, its enclosure, and your response (if any) will be made available for public inspection and copying at <http://www.nrc.gov/reading-rm/adams.html> and at the NRC Public Document Room in accordance with 10 CFR 2.390, "Public Inspections, Exemptions, Requests for Withholding."

Sincerely,

***/RA/***

Gregory E. Werner, Chief  
Engineering Branch 2  
Division of Reactor Safety

Docket Nos. 50-528; 50-529; 50-530  
License Nos. NPF-41; NPF-51; NPF-74

Enclosure: Inspection Report 05000528/2018012;  
05000529/2018012; and 05000530/2018012

**U.S. NUCLEAR REGULATORY COMMISSION  
Inspection Report**

Docket Numbers: 05000528, 05000529, 05000530

License Numbers: NPF-41, NPF-51, NPF-74

Report Numbers: 05000528/2018012, 05000529/2018012, 05000530/2018012

Enterprise Identifier: I-2017-012-0023

Licensee: Arizona Public Service Company

Facility: Palo Verde Nuclear Generating Station

Location: Tonopah, Arizona

Inspection Dates: January 29, 2018, to February 15, 2018

Inspectors: J. Mateychick, Senior Reactor Inspector (Team Lead)  
B. Correll, Reactor Inspector  
N. Okonkwo, Reactor Inspector  
E. Uribe, Reactor Inspector

Approved By: G. Werner, Branch Chief  
Engineering Branch 2  
Division of Reactor Safety

Enclosure

## SUMMARY

The U.S. Nuclear Regulatory Commission continued monitoring licensee’s performance by conducting a Triennial Fire Protection Baseline Inspection at the Palo Verde Nuclear Generating Station, Units 1, 2, and 3 in accordance with the Reactor Oversight Process. The Reactor Oversight Process is the Nuclear Regulatory Commission’s program for overseeing the safe operation of commercial nuclear power reactors. Refer to <https://www.nrc.gov/reactors/operating/oversight.html> for more information. The Nuclear Regulatory Commission and self-revealed findings, violations, and additional items are summarized in the table below.

### List of Findings and Violations

Failure to provide adequate guidance to personnel to assure degraded or deficient emergency lighting required for post-fire safe shutdown was corrected in a timely manner.			
Cornerstone	Significance	Cross-cutting Aspect	Report Section
Mitigating Systems	Green Finding FIN 05-000528/2018012-01; 05-000529/2018012-01; 05-000530/2018012-01 Closed	None	71111.05T- Fire Protection (Triennial)
The inspectors identified a Green finding for failure to provide adequate guidance to assure degraded or deficient emergency lighting required for post-fire safe shutdown is corrected in a timely manner. Specifically, the licensee failed to specify that failed Appendix R emergency lighting observed during operator rounds must be promptly reported to ensure the 30-day repair requirement can be met.			

## **INSPECTION SCOPES**

Inspections were conducted using the appropriate portions of the inspection procedures in effect at the beginning of the inspection unless otherwise noted. Currently approved inspection procedures with their attached revision histories are located on the public website at <http://www.nrc.gov/reading-rm/doc-collections/insp-manual/inspection-procedure/index.html>. Samples were declared complete when the inspection procedure requirements most appropriate to the inspection activity were met consistent with Inspection Manual Chapter (IMC) 2515, "Light-Water Reactor Inspection Program - Operations Phase." The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel to assess licensee performance and compliance with Commission rules and regulations, license conditions, site procedures, and standards."

## **REACTOR SAFETY**

### 71111.05T - Fire Protection (Triennial)

The inspectors evaluated the design, operational status, and material condition of the licensee's fire protection program, including assumptions made in plant and area specific fire protection analyses, by verifying that the licensee's program includes:

- (1) Adequate controls for combustibles and ignition sources inside the plant;
- (2) Adequate fire detection and suppression capability;
- (3) Passive fire protection features in good material condition;
- (4) Adequate compensatory measures for out-of-service, degraded or inoperable fire protection equipment, systems, or features;
- (5) Adequate protection to ensure the post-fire capability to safely shut down the plant, including implementation of NRC/industry fire-induced circuit failure analysis guidance;
- (6) Feasible and reliable manual actions when appropriate to achieve safe shutdown; and
- (7) Adequate review and documentation of fire protection program changes.

### Fire Protection Risk-Significant Fire Area Inspection Activities (4 Samples)

The inspection team used the fire hazards analysis section of the Palo Verde Nuclear Generating Station Individual Plant Examination of External Events to select the following four risk-significant fire areas for review:

- (1) Fire Area 1D, Fire Zone 7A, Channel A DC Equipment Room
- (2) Fire Area 1F, Fire Zone 5A, train A Engineered Safety Features Switchgear Room
- (3) Fire Area 15C, Fire Zone 42D, Auxiliary Building 100' Elevation West Corridors
- (4) Fire Area 15D, Fire Zone 42C, Auxiliary Building 100' Elevation East Corridors

The inspectors reviewed and evaluated the following fire protection inspection requirements:

- (1) Fire brigade drill performance
- (2) Protection of safe shutdown capabilities
- (3) Passive fire protection
- (4) Active fire protection
- (5) Protection from damage from fire suppression activities
- (6) Alternative shutdown capability
- (7) Circuit analysis
- (8) Communications
- (9) Emergency lighting
- (10) Cold shutdown repairs
- (11) Compensatory measures
  - a. Compensatory measures for degraded fire protection components
  - b. Manual actions as compensatory measures for safe shutdown
- (12) Review and documentation of fire protection plan changes
- (13) Control of transient combustibles and ignition sources
- (14) Sample of fire protection corrective action documents

#### B.5.b Inspection Activities (2 Samples)

The inspectors evaluated feasibility of the B.5.b mitigating strategies by determining the following:

- Procedures are being maintained and adequate.
- Equipment is properly staged and is being maintained and tested.
- Station personnel are knowledgeable and can implement the procedures.

The inspectors reviewed the following two mitigating strategies contained in Procedure 79IS-9ZZ05, "Palo Verde Nuclear Generating Station Severe Accident Management Guidelines," Revision 22:

- Appendix 16 – Containment Flooding

- Appendix 18 – Feed Steam Generators from Auxiliary Feedwater – Fire Protection Cross-Tie

## INSPECTION RESULTS

Failure to provide adequate guidance to personnel to assure degraded or deficient emergency lighting required for post-fire safe shutdown was corrected in a timely manner.			
Cornerstone	Significance	Cross-cutting Aspect	Report Section
Mitigating Systems	Green Finding FIN 05000528/2018012-01; 05000529/2018012-01; 05000530/2018012-01 Closed	None	71111.05T-Fire Protection (Triennial)
<p>The inspectors identified a Green finding for failure to provide adequate guidance to assure degraded or deficient emergency lighting required for post-fire safe shutdown is corrected in a timely manner. Specifically, the licensee failed to specify that failed Appendix R emergency lighting observed during operator rounds must be promptly reported to ensure the 30-day repair requirement can be met.</p>			
<p><u>Description:</u> The licensee provides emergency lighting for access and egress paths, and to illuminate required safe shutdown components to safely shut down the reactor in case of fire requiring control room evacuation, in accordance with 10 CFR 50, Appendix R, Section III.J., Procedure 40DP-9ZZ16, “Administrative Controls for Appendix R Equipment,” Revision 13, Steps 4.5.1 and 4.6.1, limit the out-of-service time for Appendix R equipment and require restoring the equipment to service within 30 days. The licensee provides guidance to operations department watch standers to check for deficient lighting throughout the plant. Procedure 40DP-9OP20, “Watch Standing Practices,” Revision 48, Step 4.3.1.1 instructs watch standers to check for “adequate or sufficient lighting,” among other items during routine tours of the plant.</p> <p>On January 30, 2018, during the walkdown of the control room evacuation due to fire Procedure 40AO-9ZZ19, “Control Room Fire,” Revision 35, the inspectors identified multiple examples of Appendix R emergency light fixtures that were not functional. The licensee confirmed no condition report had documented these deficient emergency lights at that time. During operator rounds through the area, with offsite power available, the area had adequate and sufficient lighting from the normal AC lighting system. The guidance provided in Procedure 40DP-9OP20 was not adequate to instruct watch standers to identify when an Appendix R emergency light is not functional and to promptly identify the failure to ensure timely restoration of the light.</p> <p>Corrective Actions: The licensee documented the emergency light deficiencies in the corrective action program to initiate repairs, and also issued an Operations Communication Newsflash titled, “Actions needed on Emergency (App R) Lighting,” dated February 1, 2018. The Newsflash required all operations crews to review procedures for identifying emergency lighting deficiencies and to focus on the emergency light fixtures. The licensee has 30 days to repair and restore the emergency lights to operation. The licensee has a standing</p>			

compensatory measure for emergency lighting requiring operators to obtain flashlights from the emergency storage locker during a control room evacuation due to fire. The licensee initiated a revision request to provide additional guidance in Procedure 40DP-9OP20, concerning the Appendix R emergency lighting.

Corrective Action Reference(s): 18-01512, 18-01683, 18-01685, 18-01702, 18-01737

Performance Assessment:

Performance Deficiency: The Licensee failed to provide adequate guidance to personnel to assure degraded or deficient emergency lighting required for post-fire safe shutdown was corrected in a timely manner. The licensee failed to specify in Procedure 40DP-0OP20, "Watch Standing Practices," that degraded or deficient Appendix R emergency lighting was to be promptly identified to ensure restoration within the licensee's 30-day requirement.

Screening: The inspectors determined the performance deficiency was more than minor because it adversely affected the Protection Against External Factors (Fire) attribute of the Mitigating Systems cornerstone to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, emergency lighting is required for access and egress, and to illuminate safe shutdown equipment needed to bring the reactor to safe shutdown following a fire.

Significance: The inspectors assessed the significance of the finding using Inspection Manual Chapter (IMC) 0609, Appendix F, "Fire Protection," dated September 20, 2013. The finding is associated with the Mitigating Systems cornerstone and screened to Green with Step 1.3.1 because the reactor is able to reach and maintain safe shutdown conditions because the operators are required to carry flashlights to accomplish the safe shutdown procedure.

Cross-cutting Aspect: No cross-cutting aspect was assigned to this finding because the inspectors determined the finding did not reflect present licensee performance.

Enforcement: Inspectors did not identify a violation of regulatory requirements associated with this finding.

**EXIT MEETINGS AND DEBRIEFS**

The inspectors verified no proprietary information was retained or documented in this report.

On February 15, 2018, the inspector presented the triennial fire protection inspection results to Ms. M. Lacal, Senior Vice-President Regulatory and Oversight, and other members of the licensee staff.

**DOCUMENTS REVIEWED**

The documents reviewed related to the finding are included in the inspection results section.



PALO VERDE NUCLEAR GENERATING STATION, UNITS 1, 2, AND 3 - NRC TRIENNIAL  
 FIRE PROTECTION BASELINE INSPECTION REPORT (NRC INSPECTION REPORT  
 05000528/2018012; 05000529/2018012; 05000530/2018012) – MARCH 16, 2018

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