



102-07305-MLL/TNW  
July 21, 2016

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U. S. Nuclear Regulatory Commission  
ATTN: Document Control Desk  
Washington, DC 20555-0001

Dear Sirs:

Subject: **Palo Verde Nuclear Generating Station (PVNGS)**  
**Units 1, 2, and 3**  
**Docket Nos. STN 50-528, 50-529, and 50-530**  
**Renewed Operating License Nos. NPF-41, NPF-51, NPF-74**  
**Response to NRC Staff Request for Additional Information Regarding**  
**License Amendment Request to Revise Technical Specifications Related**  
**to Degraded and Loss of Voltage Relay Modifications**

By letter dated April 1, 2016 (Agencywide Documents Access and Management System Accession No. ML16096A337), Arizona Public Service Company (APS) submitted a license amendment request (LAR) pursuant to the provisions of Section 50.90 of Title 10 of the *Code of Federal Regulations* (10 CFR), for Palo Verde Nuclear Generating Station (PVNGS), Units 1, 2, and 3, requesting approval of proposed changes to the PVNGS Technical Specifications (TS).

The proposed LAR would revise TS requirements related to the degraded and loss of voltage relays that are planned to be modified to be more aligned with designs generally implemented in the industry. Specifically, the licensing basis for degraded voltage protection will be changed from reliance on a TS initial condition that ensures adequate post-trip voltage support of accident mitigation equipment to crediting automatic actuation of the degraded and loss of voltage relays to ensure proper equipment performance.

The U.S. Nuclear Regulatory Commission (NRC) staff from the Probabilistic Risk Assessment Operations and Human Factors Branch (APHB) provided requests for additional information (RAIs) by NRC document, dated June 29, 2016 (ADAMS Accession No. ML16181A334). The Enclosure to this letter provides the APS response to the RAIs. The RAI responses do not affect the conclusions of the no significant hazards consideration determination [10 CFR 50.91(a)] provided in the original LAR.

No new commitments are being made in this submittal. Should you need further information regarding this response, please contact Michael D. Dilorenzo, Licensing Section Leader, at (623) 393-3495.

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Relay Modifications  
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I declare under penalty of perjury that the foregoing is true and correct.

Executed on : July 21, 2016  
(Date)

Sincerely,

MLL/TNW/CJS/af

Enclosure: Response to NRC Staff Requests for Additional Information (RAIs) Regarding  
License Amendment Request to Revise Technical Specifications Related to  
Degraded and Loss of Voltage Relay Modifications

cc: K. M. Kennedy NRC Region IV Regional Administrator  
S. P. Lingam NRC NRR Project Manager for PVNGS  
M. M. Watford NRC NRR Project Manager  
C. A. Peabody NRC Senior Resident Inspector for PVNGS  
A. V. Godwin Arizona Radiation Regulatory Agency (ARRA)  
T. Morales Arizona Radiation Regulatory Agency (ARRA)

**Enclosure**

**Response to NRC Staff Requests for Additional Information (RAIs)  
Regarding License Amendment Request to Revise Technical  
Specifications Related to Degraded and Loss of Voltage Relay  
Modifications**

Response to NRC Staff RAIs Regarding LAR to Revise Technical Specifications  
Related to Degraded and Loss of Voltage Relays

## Introduction

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The U.S. Nuclear Regulatory Commission (NRC) staff from the Probabilistic Risk Assessment Operations and Human Factors Branch (APHB) provided requests for additional information (RAIs) by NRC document, dated June 29, 2016 (ADAMS Accession No. ML16181A334). This Enclosure provides the APS response to each of the RAIs. The NRC staff requests for information are provided first, followed by the APS response.

### NRC Staff Request 1:

*Please identify any operator manual actions that will be added, deleted, or changed to support the proposed license amendment. Explain what cues are provided to personnel that manual action(s) is/are required as well as any cues that are provided to personnel that the proposed action(s) is/are no longer required? Also, describe any administrative controls that exist to assure that, when the action(s) is/are no longer required, the plant configuration is put in the correct configuration for the plant status?*

### APS Response 1:

No operator manual actions are added, deleted or changed to support the proposed license amendment.

The change to the degraded voltage scheme adds a short stage timer (less than 10 seconds) to respond to a degraded voltage condition concurrent with a safety injection actuation signal (SIAS). The existing degraded voltage relay (DVR) time delay (approximately 35 seconds) remains essentially unchanged for degraded voltage conditions without a SIAS present. The loss of voltage relay (LVR) time delay design is changed from an inverse time delay relay to a fixed time delay. The time delays and relay actuations are automatic and do not require operator manual actions. Since there are no operator manual actions, there are no cues needed for operator manual actions or cues needed to indicate that operator manual actions are no longer required.

Operator actions to respond to the automatic actuations of the DVRs and LVRs, including actions to assure correct configuration for the plant status, are also unchanged by the LAR.

Response to NRC Staff RAIs Regarding LAR to Revise Technical Specifications  
Related to Degraded and Loss of Voltage Relays

**NRC Staff Request 2:**

*Please describe any changes to operating procedures needed to support the proposed license amendment.*

*If the Emergency Operating Procedures are affected, describe any changes that were required of the Control Room task analysis that was done as part of your Detailed Control Room Design Review. If no update to the task analysis was necessary, describe how task requirements were developed.*

**APS Response 2:**

The proposed license amendment changes the PVNGS design and licensing basis such that the design will rely upon the automatic actuation of the degraded voltage protection scheme (DVRs and LVRs) without crediting the current administrative controls, once the modifications are completed on each of the Class 1E buses in each of the three PVNGS units.

The following procedures will be changed to implement the proposed modifications to the DVRs and LVRs:

40AL-9RK1A, *Panel B01A Alarm Responses*  
40AL-9RK1B, *Panel B01B Alarm Responses*  
40AL-9RK1C, *Panel B01C Alarm Responses*  
40ST-9ZZ37, *Inoperable Power Sources Action Statement*

These procedures will contain descriptions of the setpoints and time delays for the DVRs and LVRs used in the proposed degraded voltage protection scheme and will be tracked through completion as part of implementation of the approved license amendment.

No emergency operating procedures are affected; therefore, no emergency operating procedure control room task analysis is planned.

**NRC Staff Request 3:**

*Please describe any changes to controls or displays (including annunciators and alarms) needed to support the proposed license amendment.*

**APS Response 3:**

No changes to controls or displays are required to support the proposed license amendment. The DVR and LVR automatic actuations are annunciated in the control room on Panel B01. The change to the degraded voltage relay scheme adds a short stage timer (less than 10 seconds) to respond to a degraded voltage condition concurrent with a SIAS. The existing DVR time delay (approximately 35 seconds) remains essentially unchanged for degraded voltage conditions without a SIAS present. The LVR time delay

Response to NRC Staff RAIs Regarding LAR to Revise Technical Specifications  
Related to Degraded and Loss of Voltage Relays

design is changed from an inverse time delay relay to a fixed time delay. The specific DVR time delays and LVR time delays are not displayed or controlled in the control room.

**NRC Staff Request 4:**

*Please describe any changes to training and the simulator needed to support the proposed license amendment.*

**APS Response 4:**

The proposed license amendment changes the PVNGS design and licensing basis such that the design will rely upon the automatic actuation of the degraded voltage protection scheme (DVRs and LVRs) without crediting the current administrative controls, once the modifications are completed on each of the Class 1E buses in each of the three PVNGS units. Actions have been created to ensure updates to training materials and settings affected by the proposed modification and LAR are completed as part of implementation of the approved license amendment. The following lesson plans and simulator modeling will be updated to implement the proposed modifications to the DVRs and LVRs:

- Lesson plan regarding the balance of plant engineered safety features actuation system
- Simulator lesson plan for loss of offsite power/loss of forced circulation
- Licensed operator initial training lesson plan
- Licensed operator continuing training lesson plan
- Simulator modeling for degraded voltage protection scheme (DVRs and LVRs)

The updates to training materials and simulator modeling address the changes to the surveillance requirements of TS 3.3.7, the type and design of relays installed for the Class 1E buses and transitioning to automatic actuation of the DVRs and LVRs for degraded voltage protection for SIAS and non-SIAS plant events.