



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION**  
WASHINGTON, D.C. 20555-0001

August 18, 2016

Mr. Randall K. Edington  
Executive Vice President Nuclear/  
Chief Nuclear Officer  
Mail Station 7602  
Arizona Public Service Company  
P.O. Box 52034  
Phoenix, AZ 85072-2034

**SUBJECT: PALO VERDE NUCLEAR GENERATING STATION, UNITS 1, 2,  
AND 3 - REGULATORY AUDIT PLAN FOR AUGUST 26, 2016, AUDIT AT  
WESTINGHOUSE FACILITY IN ROCKVILLE, MARYLAND, IN SUPPORT OF  
DEGRADED AND LOSS OF VOLTAGE RELAYS LICENSE AMENDMENT  
REQUEST (CAC NOS. MF7569, MF7570, AND MF7571)**

Dear Mr. Edington:

By letter dated April 1, 2016 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML16096A337), as supplemented by letter dated July 21, 2016 (ADAMS Accession No. ML16203A381), Arizona Public Service Company (the licensee) submitted a license amendment request (LAR) for Palo Verde Nuclear Generating Station, Units 1, 2, and 3, requesting an approval to revise the Technical Specifications (TSs). The proposed LAR by the licensee would revise TS requirements regarding 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.

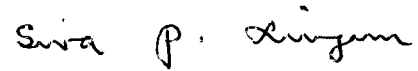
To support its safety evaluation, the NRC staff will conduct an audit at the Westinghouse facility in Rockville, Maryland, on August 26, 2016. The Enclosure to this letter provides an audit plan in support of this audit.

R. Edington

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If you have any questions, please contact me at 301-415-1564 or via e-mail at [Siva.Lingam@nrc.gov](mailto:Siva.Lingam@nrc.gov).

Sincerely,

Handwritten signature of Siva P. Lingam in black ink.

Siva P. Lingam, Project Manager  
Plant Licensing Branch IV-1  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

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

Enclosure:  
Regulatory Audit Plan

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REGULATORY AUDIT PLAN FOR AUGUST 26, 2016, AUDIT AT WESTINGHOUSE FACILITY  
IN ROCKVILLE, MARYLAND, TO SUPPORT REVIEW OF  
DEGRADED AND LOSS OF VOLTAGE RELAYS LICENSE AMENDMENT REQUEST  
ARIZONA PUBLIC SERVICE COMPANY  
PALO VERDE NUCLEAR GENERATING STATION, UNITS 1, 2, AND 3  
DOCKET NOS. 50-528, 50-529, AND 50-530

1.0 BACKGROUND

The U.S. Nuclear Regulatory Commission (NRC) staff is currently engaged in a review of a license amendment request (LAR) for the Palo Verde Nuclear Generating Station (PVNGS), Units 1, 2, and 3. By letter dated April 1, 2016 (Reference 1), as supplemented by letter dated July 21, 2016 (Reference 2), Arizona Public Service Company (APS, the licensee) submitted an LAR for PVNGS, Units 1, 2, and 3, requesting an approval to revise the Technical Specifications (TSs). The proposed LAR would revise TS requirements regarding the degraded and loss of voltage relays (DVR and LoVR) 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 DVR and LoVR to ensure proper equipment performance.

After specifically reviewing the Allowable Value changes proposed in Surveillance Requirement (SR) 3.3.7.4, the NRC staff from Instrumentation and Controls Branch (EICB) prepared draft requests for additional information (RAIs) that were transmitted to APS by e-mail on July 28, 2016. Subsequently, at the licensee's request, the NRC and APS staff held a clarification conference call on August 10, 2016, discussing the draft RAIs. As a result of this conference call, the NRC staff revised the RAIs (that are in alignment with the clarification), which were transmitted to the licensee by e-mail on August 17, 2016 (Reference 3). During the conference call, the NRC and APS staff agreed to an NRC audit related to, but not limited to, the first two RAIs. As a result, the NRC staff's regulatory audit of the PVNGS LAR has been scheduled to be conducted in accordance with the Office of Nuclear Reactor Regulation (NRR) Office Instruction LIC-111, "Regulatory Audits" (Reference 4), for the NRC staff to gain a better understanding of the licensee's calculations and other aspects of the LAR.

2.0 REGULATORY AUDIT BASIS

To support its safety evaluation, the NRC Instrumentation and Controls Branch (EICB) will conduct an audit in Rockville, Maryland. The purpose of this audit is to gain a better understanding of the modifications being performed at the plant and to confirm that revised system setpoints have been developed in accordance with regulatory requirements.

.Enclosure

The basis of this audit is APS's DVR and LoVR LAR and the following regulations and regulatory guidance:

Paragraph 10 CFR 50.36(a)(1) of Title 10 of the *Code of Federal Regulations* (10 CFR), Part 50, states, in part: "Each applicant for a license authorizing operation of a production or utilization facility shall include in his application proposed technical specifications in accordance with the requirements of this section." Paragraph 10 CFR 50.36(c)(1)(ii)(A) states, in part: "Where a limiting safety system setting is specified for a variable on which a safety limit has been placed, the setting must be so chosen that automatic protective action will correct the abnormal situation before a safety limit is exceeded. If, during operation, it is determined that the automatic safety system does not function as required, the licensee shall take appropriate action, which may include shutting down the reactor."

Paragraph 10 CFR 50.36(c)(2)(i) states, in part: "Limiting conditions for operation are the lowest functional capability or performance levels of equipment required for safe operation of the facility. When a limiting condition for operation of a nuclear reactor is not met, the licensee shall shut down the reactor or follow any remedial action permitted by the technical specifications until the condition can be met. When a limiting condition for operation of any process step in the system of a fuel reprocessing plant is not met, the licensee shall shut down that part of the operation or follow any remedial action permitted by the technical specifications until the condition can be met."

Paragraph 10 CFR 50.36(c)(3) states: "Surveillance requirements are requirements relating to test, calibration, or inspection to assure that the necessary quality of systems and components is maintained, that facility operation will be within safety limits, and that the limiting conditions for operation will be met."

Appendix A, "General Design Criteria for Nuclear Power Plants," to 10 CFR Part 50 establishes the minimum necessary design, fabrication, construction, testing, and performance requirements for structures, systems, and components important to safety; that is, structures, systems, and components that provide reasonable assurance that the facility can be operated without undue risk to the health and safety of the public.

General Design Criterion (GDC) 13, states: "Instrumentation shall be provided to monitor variables and systems over their anticipated ranges for normal operation, for anticipated operational occurrences, and for accident conditions as appropriate to assure adequate safety, including those variables and systems that can affect the fission process, the integrity of the reactor core, the reactor coolant pressure boundary, and the containment and its associated systems. Appropriate controls shall be provided to maintain these variables and systems within prescribed operating ranges."

GDC 20, states: "The protection system shall be designed (1) to initiate automatically the operation of appropriate systems including the reactivity control systems, to assure that specified acceptable fuel design limits are not exceeded as a result of anticipated operational occurrences and (2) to sense accident conditions and to initiate the operation of systems and components important to safety."

Regulatory Guide (RG) 1.105, Revision 3, "Setpoints for Safety-Related Instrumentation" (Reference 5), describes a method acceptable to the NRC staff for complying with the NRC's

regulations for ensuring that setpoints for safety-related instrumentation are initially within and remains within the TS limits. The RG endorses Part 1 of the Instrument Society of America (ISA)-S67.04-1994, "Setpoints for Nuclear Safety Related Instrumentation," subject to NRC staff clarifications. The ISA standard provides a basis for establishing setpoints for nuclear instrumentation for safety systems and addresses known contributing errors in the channel. Part 1 establishes a framework for ensuring that setpoints for nuclear safety-related instrumentation are established and maintained within specified limits.

### 3.0 REGULATORY AUDIT SCOPE

#### Audit Requirements

**Calculation Review** - Review Calculation 13-EC-PB-0202, "4160 V Degraded Voltage Relay (DVR) and Loss of Voltage Relay (LoVR) Setpoint & Calibration" to confirm the proposed allowable values in SR 3.3.7.4 conform to the criteria of RG 1.105, Revision 3.

**Work Order History Review** - The NRC staff will review data used to calculate the uncertainty limits established for the modified system components. Refer to Sections 5.11.2 and 5.11.3 of the LAR, which contains the Work Order History of ABB Type 27N Relays and Agastat ETR Timers, respectively.

### 4.0 INFORMATION NECESSARY FOR THE REGULATORY AUDIT

The following documentation and supporting materials will be required for performance of this audit. The NRC requests that these documents be available to the audit team upon arrival.

- Calculation 13-EC-PB-0202, 4160 V Degraded Voltage Relay (DVR) and Loss of Voltage Relay (LoVR) Setpoint & Calibration, Revision 5
- Plant data used to calculate the uncertainty limits established for the modified system components.

Note: Non-docketed licensee information will not be removed from the audit site.

### 5.0 TEAM ASSIGNMENTS / RESOURCE ESTIMATES

<b>Area of Review</b>	<b>Assigned Auditor</b>
Audit Lead	Richard Stattel (NRC)
Technical Reviewer	Subinoy Mazumdar (NRC)
Technical Reviewer	Gursharan Singh (NRC)
Project Manager	Siva P. Lingam (NRC)

The resource estimate for this audit is approximately 20 hours of direct audit effort.

Additional information needs identified during the audit will be communicated to the designated point of contact.

The NRC staff also requests the licensee to make personnel who are familiar with the LAR (including site staff and contractors, if appropriate) accessible upon request (either in person or by phone). The personnel should be able to respond to NRC staff questions.

## 6.0 LOGISTICS

The audit will be conducted at the Westinghouse facility in Rockville, Maryland, on August 26, 2016. Entrance and exit briefings will be held at the beginning and end of this audit, respectively. The licensee is requested to provide a room for use by the audit team.

The audit will start at 8:30 a.m. on Friday, and conclude on the same day.

The tentative schedule for the audit is as follows:

### August 26, 2016

8:30 a.m.	Check-in at Westinghouse Office – Meet Licensee Contacts, Set Up for Entrance Meeting
9:00 a.m.	Entrance Briefing – Introductions, Audit Activities, Goals, Logistics
9:30 a.m.	Begin Review of the Calculation
12:00 p.m.	Lunch
1:00 p.m.	Continue Review of the Calculation
1:15 p.m.	Complete Review of the Calculation, <u>and/or</u> Address Additional Issues and Questions
1:30 p.m.	Begin Review of the Work Order History Review
2:30 p.m.	NRC Audit Team Caucus
2:45 p.m.	NRC / Licensee Exit Briefing – Summary of Audit Results
3:00 p.m.	Adjourn

## 7.0 DELIVERABLES

At the conclusion of the audit, the NRC staff will provide a summary of audit results for each of the topics defined in the audit scope. The NRC Regulatory Audit Report will be issued on or before October 23, 2016.

## 8.0 REFERENCES

1. Lacal, M. L., Arizona Public Service Company letter to U.S. Nuclear Regulatory Commission, "License Amendment Request to Revise Technical Specifications Regarding Degraded and Loss of Voltage Relay Modifications," dated April 1, 2016 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML16096A337).
2. Lacal, M. L., Arizona Public Service Company, letter to U.S. Nuclear Regulatory Commission, "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," dated July 21, 2016 (ADAMS Accession No. ML16203A381).

3. Lingam, S. P., U.S. Nuclear Regulatory Commission, e-mail to Michael DiLorenzo and Thomas Weber, Arizona Public Service Company, "Palo Verde Nuclear Generation Plant, Units 1, 2, and 3 - Official EICB RAIs for LAR Associated with Degraded and Loss of Voltage Relay Modifications (CAC Nos. MF7569, MF7570, and MF7571)," dated August 17, 2016 (ADAMS Accession No. ML16230A231).
4. U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation (NRR) Office Instruction, LIC-111, "Regulatory Audits," dated December 16, 2008 (ADAMS Accession No. ML082900195).
5. U.S. Nuclear Regulatory Commission, Regulatory Guide 1.105, Revision 3, "Setpoints for Safety-Related Instrumentation," December 1999 (ADAMS Accession No. ML993560062).
6. U.S. Nuclear Regulatory Commission, NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR Edition," Chapter 7, Draft Revision 7, "Instrumentation and Controls," August 2015 (ADAMS Accession No. ML15159B042).
7. U.S. Nuclear Regulatory Commission, Regulatory Guide 1.153, Revision 1, "Criteria for Safety Systems," June 1996 (ADAMS Accession No. ML003740022).

R. Edington

- 2 -

If you have any questions, please contact me at 301-415-1564 or via e-mail at [Siva.Lingam@nrc.gov](mailto:Siva.Lingam@nrc.gov).

Sincerely,

**/RA/**

Siva P. Lingam, Project Manager  
Plant Licensing Branch IV-1  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket Nos. STN 50-528, STN 50-529,  
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**ADAMS Accession No.: ML16230A604**

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