



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

February 7, 2017

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 –  
STAFF REVIEW OF MITIGATION STRATEGIES ASSESSMENT REPORT OF  
THE IMPACT OF THE REEVALUATED SEISMIC HAZARD DEVELOPED IN  
RESPONSE TO THE MARCH 12, 2012, 50.54(f) LETTER (CAC NOS. MF7856,  
MF7857 AND MF7858)

Dear Mr. Bement:

The purpose of this letter is to provide the U.S. Nuclear Regulatory Commission's (NRC's) assessment of the seismic hazard mitigation strategies assessment (MSA), as described in a January 31, 2017, letter (Agencywide Documents Access and Management System (ADAMS) Accession No. ML17031A185) submitted by Arizona Public Service Company (the licensee), for Palo Verde Nuclear Generating Station, Units 1, 2, and 3 (Palo Verde). The MSA confirms that the licensee has adequately addressed the reevaluated seismic hazard within its mitigating strategies for beyond-design-basis external events.

BACKGROUND

By letter dated March 12, 2012 (ADAMS Accession No. ML12053A340), the NRC issued a request for information pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR), Section 50.54(f) (hereafter referred to as the 50.54(f) letter). The 50.54(f) letter was issued as part of implementing lessons learned from the accident at the Fukushima Dai-ichi nuclear power plant. Enclosure 1 to the 50.54(f) letter requested licensees reevaluate the seismic hazard using present-day methodologies and guidance. Concurrent with the reevaluation of seismic hazards, the NRC issued Order EA-12-049, "Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events" (ADAMS Accession No. ML12054A736). The order requires holders of operating power reactor licenses and construction permits issued under 10 CFR Part 50 to develop, implement, and maintain guidance and strategies to maintain or restore core cooling, containment, and spent fuel pool cooling following a beyond-design-basis external event.

By letter dated March 10, 2015 (ADAMS Accession No. ML15076A073), the licensee provided its reevaluated seismic hazard for Palo Verde in response to the 50.54(f) letter.

On December 10, 2015 (ADAMS Accession No. ML16005A621), the Nuclear Energy Institute (NEI) submitted Revision 2 to NEI 12-06, including guidance for MSAs regarding reevaluated hazard information. The NRC subsequently endorsed NEI 12-06, Revision 2, with exceptions, clarifications, and additions, in Japan Lessons-Learned Division (JLD) interim staff guidance (ISG) JLD-ISG-2012-01, Revision 1, "Compliance with Order EA-12-049, Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events" (ADAMS Accession No. ML15357A163).

### MITIGATION STRATEGIES ASSESSMENT

By letter dated September 13, 2016 (ADAMS Accession No. ML16221A604), the NRC staff documented its review of the licensee's reevaluated seismic hazard, also referred to as the mitigating strategies seismic hazard information. The staff confirmed the licensee's conclusion that its reevaluated seismic hazard is bounded by the current design-basis at most frequencies above 1 Hertz (Hz). Minor exceedances were noted at approximately 1.2 Hz and at greater than 35 Hz. However, these exceedances are considered "de minimis" (too minor to merit consideration). In addition, the staff concluded that the ground motion response spectrum determined by the licensee adequately characterizes the reevaluated seismic hazard for the Palo Verde site.

Appendix H of NEI 12-06, Revision 2, describes acceptable methods for demonstrating that the reevaluated seismic hazard is addressed within the Palo Verde mitigating strategies for beyond-design-basis external events. The licensee stated that the Palo Verde MSA was performed consistent with NEI 12-06, Revision 2. The NRC staff confirmed that the licensee's seismic hazard MSA is consistent with the guidance in Appendix H.4.1 of NEI 12-06, Revision 2, as endorsed by JLD-ISG-2012-01, Revision 1. Therefore, the methodology used by the licensee is appropriate to perform an assessment of the mitigation strategies that addresses the reevaluated seismic hazard.

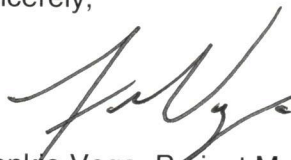
The NRC staff has reviewed the seismic hazard MSA for Palo Verde. The NRC staff concludes that sufficient information has been provided to demonstrate that the licensee's plans for the development and implementation of guidance and strategies under Order EA-12-049 appropriately address the reevaluated seismic hazard information stemming from the 50.54(f) letter.

R. Bement

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If you have any questions, please contact me at (301) 415-1617 or via e-mail at [Frankie.Vega@nrc.gov](mailto:Frankie.Vega@nrc.gov).

Sincerely,

A handwritten signature in black ink, appearing to read 'Frankie Vega', with a stylized flourish at the end.

Frankie Vega, Project Manager  
Hazards Management Branch  
Japan Lessons-Learned Division  
Office of Nuclear Reactor Regulation

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

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PALO VERDE NUCLEAR GENERATING STATION, UNITS 1, 2, AND 3 – STAFF REVIEW OF MITIGATION STRATEGIES ASSESSMENT REPORT OF THE IMPACT OF THE REEVALUATED SEISMIC HAZARD DEVELOPED IN RESPONSE TO THE MARCH 12, 2012, 50.54(f) LETTER DATED FEBRUARY 7, 2017

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**ADAMS Accession No. :** ML17037D257

**\* via e-mail**

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