

February 21, 2017

MEMORANDUM TO: Robert J. Pascarelli, Chief  
Plant Licensing Branch IV  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

FROM: Robert G. Lukes, Chief **/RA/**  
Nuclear Performance and Code Review Branch  
Division of Safety Systems  
Office of Nuclear Reactor Regulation

SUBJECT: PLAN FOR SECOND AUDIT SUPPORTING U.S. NUCLEAR  
REGULATORY COMMISSION REVIEW OF "PALO VERDE  
NUCLEAR GENERATING STATION, UNITS 1, 2, AND  
3 – TRANSITION TO COMBUSTION ENGINEERING 16X16  
NEXT GENERATION FUEL AND REVISED TECHNICAL  
SPECIFICATIONS 5.6.5 AND 4.2.1" (CAC NOS. MF8076,  
MF8077, MF8078, MF8079, MF8080, AND MF8081)

By application dated July 1, 2016, Arizona Public Service requested changes to the Technical Specifications (TS) for Palo Verde Nuclear Generating Station (PVNGS), Units 1, 2, and 3. The proposed changes revise TS 4.2.1, "Reactor Core, Fuel Assemblies" and 5.6.5.b, "Core Operating Limits Report (COLR)" and will allow the use of Combustion Engineering 16x16 Next Generation Fuel clad with the Optimized ZIRLO™ material in PVNGS, Units 1, 2, and 3.

The staff are proposing a second regulatory audit at this point in the review process to focus the staff's requests for additional information and enhance technical understanding of the submitted documentation. A proposed audit plan is attached.

Docket Nos.: 50-528  
50-529  
50-530

Enclosure:  
As stated

CONTACT: Daniel R. Beacon, NRR/DSS  
301-415-2820

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Accession No.: ML17048A496

NRR-106

OFFICE	NRR/DSS/SNPB	NRR/DSS/SNPB	NRR/DSS/SNPB: BC
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DATE	02/21/2017	02/21/2017	02/21/ 2017

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**SECOND REGULATORY AUDIT SUPPORTING U.S. NUCLEAR REGULATORY  
COMMISSION REVIEW OF “PALO VERDE NUCLEAR GENERATING STATION, UNITS 1, 2,  
AND 3 – TRANSITION TO COMBUSTION ENGINEERING 16X16 NEXT GENERATION FUEL  
AND REVISED TECHNICAL SPECIFICATIONS 5.6.5 AND 4.2.1”  
DOCKET NOS.: 50-528, 50-529, AND 50-530**

**BACKGROUND**

By application dated July 1, 2016, Arizona Public Service (APS) requested changes to the Technical Specifications (TS) for Palo Verde Nuclear Generating Station (PVNGS), Units 1, 2, and 3. The proposed changes revise TS 4.2.1, “Reactor Core, Fuel Assemblies” and 5.6.5.b, “Core Operating Limits Report (COLR)” and will allow the use of Combustion Engineering (CE) 16x16 Next Generation Fuel (NGF) clad with the Optimized ZIRLO™ material in PVNGS, Units 1, 2, and 3. To support the fuel transition, APS also requested an exemption from certain requirements of Title 10 of the *Code of Federal Regulations* (10 CFR) 50.46 and 10 CFR 50 Appendix K to allow the use of Optimized ZIRLO™ as a cladding material in PVNGS.

The U.S. Nuclear Regulatory Commission (NRC) staff conducted a regulatory audit on November 2<sup>nd</sup> and 3<sup>rd</sup>, 2016 to focus the staff’s requests for additional information (RAIs) and enhance technical understanding of the submitted documentation. During this audit, it was determined that further time would be needed to examine materials related to the statistical methodology proposed for analyzing the fuel assembly misload event and the use of the SKBOR code in the boric acid precipitation analysis that were provided during the audit, but not originally available as part of the submittal. Additionally, the NRC staff requested justification for the proposed penalty to address the lack of treatment of thermal conductivity degradation (TCD) in the FATES-3B code.

Therefore, the NRC staff has proposed to conduct a second regulatory audit at this point in the review process in an effort to resolve or focus the questions that arose from further consideration of the outstanding issues and to observe the justification for the proposed TCD penalty. This audit will help the NRC staff better understand the supporting documentation and analysis results through interaction with APS’s technical experts and will help to focus the staff’s RAIs on those questions where docketed information is needed to complete the review.

The proposed audit will be held in accordance with Office of Nuclear Reactor Regulation (NRR) procedure as described in LIC-111, “Regulatory Audits.”

**REGULATORY AUDIT SCOPE**

The NRC staff would like APS to make available appropriate staff with detailed knowledge of the PVNGS licensing basis and the related topical reports, the statistical methods used in the fuel assembly misload methodology, and the SKBOR boric acid precipitation analysis method. Additionally, APS staff should be prepared to present and answer questions about the justification for the proposed TCD penalty.

ENCLOSURE

Discussion at the audit is expected to pertain to a limited scope of the submittal, specifically including the following subjects and related points of discussion:

- Boric acid precipitation analysis methodology (SKBOR)
- Statistical treatment of the inadvertent fuel assembly misload event
- Justification for the proposed penalty to FATES-3B to account for the lack of TCD treatment

## **TEAM AND REVIEW ASSIGNMENTS**

Siva Lingam, Project Manager (NRR/DORL/LPL4-1)  
Daniel Beacon, Technical Reviewer (NRR/DSS/SNPB)  
John Lehning, Technical Reviewer (NRR/DSS/SNPB)  
Robert Lukes, Branch Chief (NRR/DSS/SNPB)

## **LOGISTICS**

Audit Date: Wednesday, March 8, 2017

Audit Location: Rockville, MD

APS should provide a conference room with a white board for discussions, as well as printed copies of reports containing the following information:

- Detailed description of the SKBOR boric acid precipitation methodology and relevant calculation notes.
- Detailed description of the statistical misload methodology and relevant calculation notes.
- Justification for the adequacy of the proposed TCD penalty on FATES-3B and relevant calculation notes.

APS should also provide any other documentation that may aid discussion on the specific topics of interest.

## **DELIVERABLES**

A regulatory audit summary will be provided within 90 days of the completion of the audit.