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June 2, 2014

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, UNIT 2 – SUMMARY OF
CONFERENCE CALL REGARDING THE SPRING 2014 STEAM GENERATOR
TUBE INSPECTIONS (TAC NO. MF4191)

Dear Mr. Edington:

On April 23, 2014, the U.S. Nuclear Regulatory Commission (NRC) staff participated in a conference call with representatives of Arizona Public Service Company (the licensee) regarding the spring 2014 steam generator tube inspection activities at Palo Verde Nuclear Generating Station, Unit 2. A summary of the conference call is enclosed.

If you have any questions, please contact me at (301) 415-1530 or via e-mail at jennivine.rankin@nrc.gov.

Sincerely,

A handwritten signature in black ink that reads "Jennie Rankin".

Jennie K. Rankin, Project Manager
Plant Licensing Branch IV-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. STN 50-529

Enclosure:
Conference Call Summary

cc w/encl: Distribution via Listserv

SUMMARY OF APRIL 23, 2014, CONFERENCE CALL
REGARDING THE SPRING 2014 STEAM GENERATOR TUBE INSPECTIONS
ARIZONA PUBLIC SERVICE COMPANY
PALO VERDE NUCLEAR GENERATING STATION, UNIT 2
DOCKET NO. STN 50-529

On April 23, 2014, the staff of the Steam Generator Tube Integrity and Chemical Engineering Branch of the Division of Engineering participated in a conference call with Arizona Public Service Company (the licensee) representatives regarding the ongoing steam generator (SG) tube inspection activities at Palo Verde Nuclear Generating Station (PVNGS), Unit 2. Information provided by the licensee in support of the conference call is located in the Agencywide Documents Access Management System under Accession No. ML14149A509.

PVNGS, Unit 2 has two replacement SGs manufactured by Ansaldo. Each SG has 12,580 thermally treated Alloy 690 tubes with an outside diameter of 0.75 inches and a wall thickness of 0.042 inches. Ferritic stainless steel eggcrate tube supports, diagonal bars, and vertical straps support the tubes at various locations.

The licensee was performing SG inspections in the spring of 2014 as part of scheduled refueling outage 18. Due to the nature and location of some wear signals and a foreign object, a conference call with the U.S. Nuclear Regulatory Commission (NRC) staff was held. Additional information discussed during the conference call and not included in the document provided by the licensee is summarized below:

- The scope of SG tube inspections included 100 percent of the tubes with a bobbin coil. The licensee performs SG tube inspections every two cycles.
- As shown on page 1 of the licensee-provided information, three tubes with wear were detected in the periphery of the tube bundle at the top of the flow distribution plate (FDP). The indications ranged from 40 to 45 percent through wall. There were no possible loose part signals associated with these indications, but the indications were attributed to wear from a foreign object. A +Point™ examination was performed on these three indications and an example of one indication is shown on page 2 of the licensee-provided information. As a result of these findings, additional +Point™ examinations on the FDP were performed. This included approximately 823 tubes radially inward from the location of the three wear signals and all peripheral tubes five rows into the tube bundle (approximately 1200 tubes). See page 4 of the licensee-provided document.
- A secondary side visual inspection confirmed the foreign object wear of the three tubes and the FDP (see page 3 of the licensee-provided document). The licensee clarified that the FDP wear scar does not challenge the structural integrity of the FDP, and the wear scar has been entered into their corrective

Enclosure

action plan. There was no foreign object in the immediate vicinity of the three tubes with wear; however, a foreign object was identified about 20 columns away (see pages 1 and 5 of the licensee-provided document). The licensee had high confidence that the foreign object located 20 columns away was the source of the wear indications on the three tubes, based on flow patterns and the location of the foreign object. The foreign object was thin and approximately 1 ¼ inches long and ½ inch tall.

- The licensee plans to stabilize and plug the three tubes containing the foreign object wear indications.
- According to the Electric Power Research Institute Guidelines (based on foreign object size and location in the tube bundle), this is a Category one foreign object, and as such, every effort should be made to retrieve it. At the time of the call, the licensee had acquired a special loose part removal tool and was preparing to retrieve the foreign object. The licensee was developing contingency plans (e.g., making a new access port in the SG or pulling some tubes and gaining access from the primary side of the SG), if the special retrieval tool was unsuccessful.
- The eddy current signature of the foreign object is similar to both high carbon steel and Type 405 stainless steel. The licensee believes it is unlikely that the foreign object is from the feedwater train, but rather, more likely to have originated from within the SG and is left over from construction.
- The licensee clarified that inspecting the patch plates is part of the SG inspection plan and that these patch plates are part of the secondary side divider plates that form part of the economizer.
- An upper bundle in-bundle inspection was performed this outage, including the central cavity region, stay cylinder, and the vertical strap to I-beam region. There was no degradation found as a result of these inspections.
- The licensee estimated that retrieval of the foreign object would cause a 1- to 2-week impact on outage schedule. Westinghouse had been retained as the design engineer in case a direct access port was needed to retrieve the foreign object.
- Subsequent to the call, the NRC staff was informed that the foreign object was removed and the licensee was evaluating exactly what the foreign object was.

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Sincerely,

/RA/

Jennie K. Rankin, Project Manager
Plant Licensing Branch IV-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

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