

December 22, 2005

James M. Levine
Executive Vice President, Generation
Mail Station 7602
Arizona Public Service Company
PO Box 52034
Phoenix, Arizona 85072-2034

SUBJECT: PALO VERDE NUCLEAR GENERATING STATION, UNITS 2 AND 3 -
REQUEST FOR ADDITIONAL INFORMATION REGARDING STEAM
GENERATOR TUBE INSPECTIONS (TAC NOS. MC8938 AND MC8939)

Dear Mr. Levine:

By letters dated November 9, 2004, April 27, October 18, and October 24, 2005, Arizona Public Service submitted the results of the steam generator tube inspections for the Spring 2005 and Fall 2004 refueling outages at the Palo Verde Nuclear Generating Station Units 2 and 3, respectively.

The Nuclear Regulatory Commission (NRC) staff has reviewed the information provided and determined that additional information is required in order to complete the evaluation. The additional information being requested is enclosed. As discussed with Tom Weber of your staff, the NRC staff is requesting a response within 90 days of this letter.

If you have any questions, please contact me at 301-415-3062.

Sincerely,

/RA/

Mel B. Fields, Senior Project Manager
Plant Licensing Branch IV
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

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

Enclosure: Request for Additional Information

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REQUEST FOR ADDITIONAL INFORMATION
ARIZONA PUBLIC SERVICE PALO VERDE UNITS 2 AND 3
STEAM GENERATOR TUBE INSPECTION REPORTS
DOCKET NOS. 50-529 AND 50-530

By letters dated November 9, 2004 (Agencywide Documents and Access Management System (ADAMS) Accession No. ML043210473), April 27, 2005 (ML051300346), October 18, 2005 (ML052980549), and October 24, 2005 (ML053130156), Arizona Public submitted the results of the steam generator tube inspections for the Spring 2005 and Fall 2004 outages at the Palo Verde Nuclear Generating Station Units 2 and 3, respectively.

The staff has reviewed the information provided and determined that the following additional information is required in order to complete the evaluation.

Questions for Palo Verde Unit 2

1. In Section 4.0 of your October 24, 2005 letter, you indicated that for steam generators 21 and 22, tubes were detected with abnormal dent indications. Were these indications present since the pre-service inspection? If so, please discuss whether they have changed since the pre-service inspection and the reasons for any change. If they were not present in the pre-service inspection, please discuss the cause of the dents. Please discuss whether these dents are considered "abnormal" since they are similar to the dent indication that was the cause of your 2004 primary-to-secondary leak.
2. In Section 4.0 of your October 24, 2005 letter, you indicated that a volumetric indication was detected and plugged. In addition, you detected several other volumetric indications. Please discuss the nature, cause, and severity of these indications.
3. Discuss whether a foreign object search and retrieval (FOSAR) was performed and whether the loose parts were removed from the steam generators. If any loose parts were not removed, please discuss whether you assessed the impact the loose part could have on tube integrity during the interval between inspections.
4. Appendices C and D of your October 24, 2005 letter, list several distorted support signals. Regarding these indications, please discuss whether these indications can be traced back to the baseline inspection? If so, have they shown any change? If change has been observed, please explain what has caused these indications to change.
5. In Section 3.0 of your October 24, 2005 letter, you indicated that an operational assessment will document your tube integrity assessment as required by NEI 97-06. Please discuss the results of this assessment (i.e., did it confirm that the tube integrity will be maintained until the next steam generator tube inspections).
7. Several tubes were identified as being plugged (R141C102, R141C112, R154C91 and R106C117); however, the information in Appendices C and D contain no information concerning the nature of the indications in these tubes. Please discuss the reason for

plugging these tubes (e.g., abnormal dents).

8. It is the NRC staff's understanding that the Palo Verde Unit 2 replacement steam generators have an economizer with a similar set screw configuration as that in Unit 3 (which experienced degradation). As a result, please discuss whether any inspections were performed to confirm the integrity of these locations. In addition, please discuss whether any other secondary side inspections were performed during the outage.
9. Discuss the scope and results of your dent examinations including a discussion of whether all dents have been examined with a rotating coil since the fabrication of the steam generators. In addition, please discuss whether any dents have changed since the pre-service inspection.
10. Please clarify the scope and results of your U-bend and square bend examinations.
11. General information concerning the design of your replacement steam generators was provided in the submittal. In order for the staff to better understand the design of your replacement steam generators, please provide the following information: model #, heat transfer surface area, flow distribution baffle (FDB) design (e.g., circular holes) and thickness, tube support plate (TSP) thickness, batwing and vertical strap thickness, and the smallest U-bend radius.

Questions for Palo Verde Unit 3

1. In Section 3.0 of your October 18, 2005 letter, you indicated that an operational assessment will document your tube integrity assessment as required by NEI 97-06. Please discuss the results of this assessment (i.e., did it confirm that the tube integrity will be maintained until the next steam generator tube inspections).
2. In Table 1 of your October 18, 2005 letter, you indicated that rotating coil examinations were performed on bobbin indications from the previous outage and from the current outage. Please clarify what types of indications (e.g., wear, manufacturing burnish marks, free span differentials, etc.) were included in this sample and whether the sample represented 100% of the bobbin indications

Please confirm that rotating coil examination was performed on any distorted support indications (DSIs) or non-quantifiable indications identified by either the primary or secondary eddy current data analyst.

3. Regarding the volumetric indications detected during the 2004 (U1R11) inspections and reported in Table 2 of your October 18, 2005 letter, please clarify whether any of the indications are a result of corrosion (i.e., volumetric indications other than manufacturing burnish marks, pit-like indications (not corrosion related), tube-to-tube wear, wear at tube supports). If any volumetric indications attributed to corrosion (e.g., intergranular attack) were left in service, please discuss your basis for leaving them in service. With respect to the volumetric indications that were plugged, please clarify the reason for plugging these indications. Specifically address whether any of the flaws previously attributed to manufacturing related reasons (e.g., manufacturing burnish marks) have

changed with time. If they have changed, please discuss why and whether this has led to any changes in how you classify indications (since the change may imply an active degradation mechanism at this location).

4. In Table 2 of your October 18, 2005 letter, you indicated that various tubes were preventatively plugged due to dents. Please discuss whether there is active denting occurring or whether these tubes were plugged for dents whose characteristics (e.g., voltage) may not have changed but that might limit the effectiveness of the eddy current examination. If active denting is occurring, please discuss the cause.
5. Please discuss the results of the rotating coil examination of your dents/dings. Please include the voltage of the dents/dings and the nature of any indications in your response. If any flaw like indications were detected in your dents/dings, please discuss the nature of the indication and the voltage of the dent/ding.
6. Please discuss the results of the rotating coil examinations of the U-bend region in rows 1-18.
7. Regarding the set screw degradation found in steam generator 32, please discuss the results of your final analysis (e.g., was it consistent with your initial analysis summarized in the NRC letter dated February 23, 2005). In addition, please discuss your plans to address the potential for continuing degradation of these set screws (including inspections and integrity assessments).