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SUBJECT: Forwards "PVNGS Unit 2 Steam Generator Insp Rept, Mid-Cycle *see*
 Outage." *Reports*

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WILLIAM F. CONWAY
EXECUTIVE VICE PRESIDENT
NUCLEAR

102-02852-WFC/RAB/JRP

March 8, 1994

**ATTN: Document Control Desk
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- Ref.: 1. Letter #102-02803, dated January 27, 1994, from J. M. Levine, Vice President, Nuclear Production, APS, to USNRC**
- 2. Letter #102-02751, dated December 6, 1993, from J. M. Levine, Vice President, Nuclear Production, APS, to USNRC**

Dear Sirs:

**Subject: Palo Verde Nuclear Generating Station (PVNGS)
Unit 2
Docket No. STN 50-529
Steam Generator Inspection Report
File: 94-056-026**

This letter is transmitting the Unit 2 Steam Generator Inspection Report, Mid-Cycle Outage. The Steam Generator Inspection Plan was submitted to the Nuclear Regulatory Commission (NRC) by References 1 and 2.

The Unit 2 Steam Generators were inspected during the recent Mid-Cycle outage (U2M5) using Eddy Current Testing (ECT) Technology comprised of both bobbin coil probe and motorized rotating pancake coil (MRPC) probe. The inspection identified a total of 330 tubes as having axial indications, 22 in SG21 and 308 in SG22. Four tubes having circumferential indications were also identified in SG22 at the hotleg tubesheet. This inspection did not identify any circumferential cracks whose size would challenge Regulatory Guide (RG) 1.121 limits based on an assumed 100 percent throughwall depth over the length of the crack.

The circumferential cracking phenomenon was previously reported by Letter 102-02716, dated November 2, 1993; and pending the completion of the quantitative analysis based on industry and PVNGS specific data, it is reasonable to treat the circumferential cracking issue as being bounded by the more aggressive axial cracking mechanism.

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In addition, the results of this inspection did not identify any axial cracks whose size would challenge RG 1.121 limits; and this was further verified by conducting in-situ pressure testing of nine (9) tubes (seven with axial indications, one in SG21 and six in SG22.) The fact that no RG 1.121 challenges were present confirms the predictions of the axial crack growth which form the basis for a six-month operating interval. The U2M5 inspection results indicate that reduced power and temperature resulted in lower crack growth rates which further support the conclusion that an allowed run time of six months is still applicable to Unit 2.

Although the inspection results from U2M5 support the continued use of the six-month operating cycle, APS will present the final RG 1.121 evaluation, incorporating tube pull results and a statistical treatment of all uncertainties, within 4 1/2 months of breaker closure. During this period, Unit 2 will continue to be operated at reduced power and temperature condition. APS intends to determine the length of the next operating interval based on the results of the statistical analysis.

Two important corrective actions are being implemented during the U2M5 outage. A chemical cleaning process to remove the bridging deposits between tubes which contribute to the formation of crevices in the free span area was completed during the outage. A boric acid treatment to address the caustic crevice environment will be initiated during startup. The determination of run time takes no credit for the benefits of these actions.

Based on the inspection results and the multi-tier approach to tube rupture prevention and mitigation described in the enclosed report, it can be concluded that operation of Unit 2 for 6 months would not constitute a safety concern.

Enclosed with this letter are copies of the Unit 2 Steam Generator Inspection Report, Mid-Cycle Outage. Should you have any questions, please contact Richard A. Bernier at (602) 393-5882.

Sincerely,

E. E. Johnson for
W F Conway

WFC/RAB/JRP/dld
Enclosures

cc: K. E. Perkins, Jr.
K. E. Johnston
B. E. Holian

STATE OF ARIZONA)
) ss.
COUNTY OF MARICOPA)

I, E. C. Simpson, represent that I am Vice President - Nuclear Support that the foregoing document has been signed by me on behalf of Arizona Public Service Company with full authority to do so, that I have read such document and know its contents, and that to the best of my knowledge and belief, the statements made therein are true and correct.

E. C. Simpson

E. C. Simpson

Sworn To Before Me This 8 Day Of March, 1994.

Roxanna Vandillen

Notary Public

My Commission Expires

June 12, 1997



